

# AI-Powered Resume Screening & Interview Assistant

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**Abstract** — The AI-Powered Resume Screening and Interview Assistant streamlines the recruitment process through two key modules: Resume Screening and Interview Assistance. The Resume Screening module takes necessary information such as skills, education, and experience from candidates resume using Natural Language Processing (NLP) technique, including Named Entity Recognition (NER). Then the model compares this data taken from the resume with the job descriptions using similarity models such as or BERT models to assess how closely the resume matches with the job description, and then providing ranking for candidates resume based on their fit. This enables applicants to make changes in their resumes to better match job requirements. The Interview Assistant module generates personalized questions based on the candidate's requirements. It conducts mock interviews through voice and analyzes the candidate's responses using sentiment analysis. Candidates receive real-time feedback, and personalized improvement suggestions. The model acts as a virtual mentor, this system prepares candidates for real-world interviews by improving their confidence.

**Keywords:** Artificial Intelligence, Resume Screening, Virtual Interview Assistance, Natural Language Processing (NLP), Named Entity Recognition (NER), BERT, Sentiment Analysis, TypeScript, Next.js, Google Gemini AI, Firebase

## I. INTRODUCTION

In today's competitive job market, recruiters face immense pressure to make swift, accurate, and unbiased hiring decisions. Traditional recruitment methods often takes time for resume scanning one after the another which would fall short in handling the modern hiring where thousands of resume need to scanned daily. To address these challenges, Artificial Intelligence (AI) is emerging as a transformative solution in the recruitment process.

This project proposes an AI-Powered Resume Screening and Interview Assistance System, which enhances the hiring process by automating resume analysis and simulating interview evaluations. In Resume Screening unlike manual or traditional screening, the AI system analyses resume with contextual understanding and matches candidate profiles with job-specific requirements. Additionally, the model provides real-time feedback on resume structure, keyword, and overall formatting which helps the applicants to align their profiles with industry expectations or the job description.

The Interview Assistant component functions as an intelligent guide, which helps candidate to prepare for interviews through mock sessions. It checks the spoken responses based on grammar, fluency, clarity, and tone of the candidate. Post-interview, the model generates a detailed feedback report highlighting areas for improvement, allows candidate to understand & overcome weaknesses and enhance performance before going to actual interviews.

By integrating both resume screening and virtual interview assessment into a single intelligent platform, this system eliminates old manual efforts in shortlisting applicants resume, ensures fair and data-driven evaluation, and reduces the overall time-to-hire. Simultaneously, it empowers job seekers—especially students and fresh graduates—to get to know about their strengths, receive instant feedback, and refine their performance before entering real-world hiring scenarios. In doing so, the project bridges the gap between academic learning and the practical expectations of the corporate world.

## II. LITERATURE SURVEY

A. Swati Sharma et al, "Empowering Careers with NLP-Driven Resume Analysis with AI Interview Bot":2024.

The study on "Empowering Careers with NLP-Driven Resume Analysis with AI Interview Bot" highlights a novel integration of Natural Language Processing (NLP) and Artificial Intelligence (AI) technologies to transform recruitment and interview preparation. The system uses NLP techniques to accurately analyze and match resumes with job descriptions, ensuring candidates are effectively aligned with suitable opportunities. Complementing this, an AI-powered interview bot conducts simulated interviews, providing real-time, personalized feedback on candidate's responses during interview, communication skills, and confidence levels. This dual functionality not only streamlines the recruitment process for organizations by automating candidate screening and preliminary evaluation but also empowers job seekers by offering practical tips and personalized feedback that candidates can use to enhance their interview skills and boost their confidence. This approach reflects a growing shift toward more data-driven and candidate-focused hiring practices, rather than traditional resume screening which designed to improve both the efficiency and fairness of the recruitment process. These smart tools play a key role in connecting a candidate's true potential with what employers are looking for, leading to more successful and meaningful hiring outcomes.

B. Shekar et al, "AI-Driven Virtual Interviewer":2025.

The application of Artificial Intelligence (AI) in the recruitment process has led to significant innovations, one of the most notable being AI-driven virtual interviewers. These systems aim to simulate real-life interview scenarios by integrating technologies such as Natural Language Processing (NLP), facial expression analysis, voice modulation tracking, and behavior monitoring. Traditional interview preparation often focuses heavily on theoretical and technical skills, overlooking critical soft skills like communication, body language, and overall presentation. To address these shortcomings, the study presented in the paper titled "AI-Driven Virtual Interviewer" published in the Multidisciplinary Global Education Journal (2025), proposes

an AI-powered platform that offers a comprehensive interview experience. It evaluates a candidate's resume, communication skills, technical knowledge, and even non-verbal cues such as eye contact and facial expressions, providing personalized feedback to help individuals enhance their performance.

Despite these advancements, ethical concerns remain. Several researchers have highlighted issues such as algorithmic bias and the inability of AI systems to fairly assess individuals with diverse speech patterns or disabilities. For example, recent reports caution that AI tools may unintentionally discriminate against non-native speakers due to inaccurate speech recognition. Therefore, while AI-driven virtual interviewers offer significant benefits in terms of efficiency and personalization, continuous improvements and ethical considerations are essential to ensure fairness and inclusivity in their application.

C. Sweta Dixit et al, "AI Power: Making Recruitment Smarter":2022.

The chapter titled "AI Power: Making Recruitment Smarter" by Sweta Dixit et al., published in *Evolution of Digitized Societies Through Advanced Technologies*, emphasizes the pivotal role of AI in streamlining recruitment activities such as sourcing, screening, and hiring. AI technologies facilitate the automation of repetitive tasks, allowing recruiters to focus on strategic functions like talent retention, Skilled Candidate. Tools such as chatbots enhance candidate engagement by handling initial queries, while AI algorithms analyze data from digital platforms to assess candidates' suitability beyond conventional resumes. This approach not only expedites the hiring process but also aims to minimize human biases, leading to more equitable hiring outcomes. The study underscores that AI's application in recruitment enhances efficiency and provides qualitative benefits for both organizations and prospective employees. Complementary research supports these findings, highlighting AI's capacity to reduce time-to-hire and improve candidate experience. For instance, companies like Unilever have leveraged AI to process large volumes of applications, significantly cutting down recruitment timelines and labour hours.

D. Param Kothari et al, "Interview Ease: AI-powered interview assistance":2024.

InterviewEase, which aim to streamline and enhance candidate readiness for job placements. InterviewEase, as detailed by Param Kothari et al., presents a comprehensive real-world AI-driven placement preparation platform comprising three core modules: a ChatGPT-based skill gap analyzer that analyse the skills of candidate and the job market description, a mock interview platform for practicing the interview before facing the real-interview, and a customizable question generator which generate the questions based on the resume given by the candidate. The skill gap analyzer compares a candidate's resume with job requirements, recommending relevant projects to bridge identified gaps. The mock interview module employs gesture detection, speech emotion recognition, and answer similarity algorithms to provide feedback on posture, speech, and responses, achieving accuracy levels of 98% for body gesture detection, 82% for speech emotion recognition, and 92% for

answer similarity comparison. Additionally, the question generator allows users to create interview questions with adjustable difficulty levels, facilitating targeted practice. This multifaceted approach addresses the limitations of traditional interview preparation methods by offering personalized, real-time feedback and resources, thereby enhancing the overall efficacy of the preparation process.

E. Abishek Mishra et al, "AI-Powered Model for Intelligent Resume Recommendation and Feedback":2024.

The study titled "AI-Powered Model for Intelligent Resume Recommendation and Feedback" presents a comprehensive approach that utilizes machine learning algorithms such as NLP to assess and recommend resumes based on job requirements. The model employs natural language processing techniques to extract relevant features from resumes and job descriptions, facilitating a more accurate matching process of the keywords. Additionally, the system provides constructive feedback to candidates, highlighting areas of improvement to align their resumes more closely with desired job profiles. This AI-driven approach not only streamlines the recruitment process for employers by efficiently shortlisting suitable candidates but also empowers job seekers by offering personalized insights to enhance their employability. The implementation of such intelligent systems signifies a shift towards more data-driven and candidate-centric recruitment strategies

### III. SYSTEM ARCHITECTURE

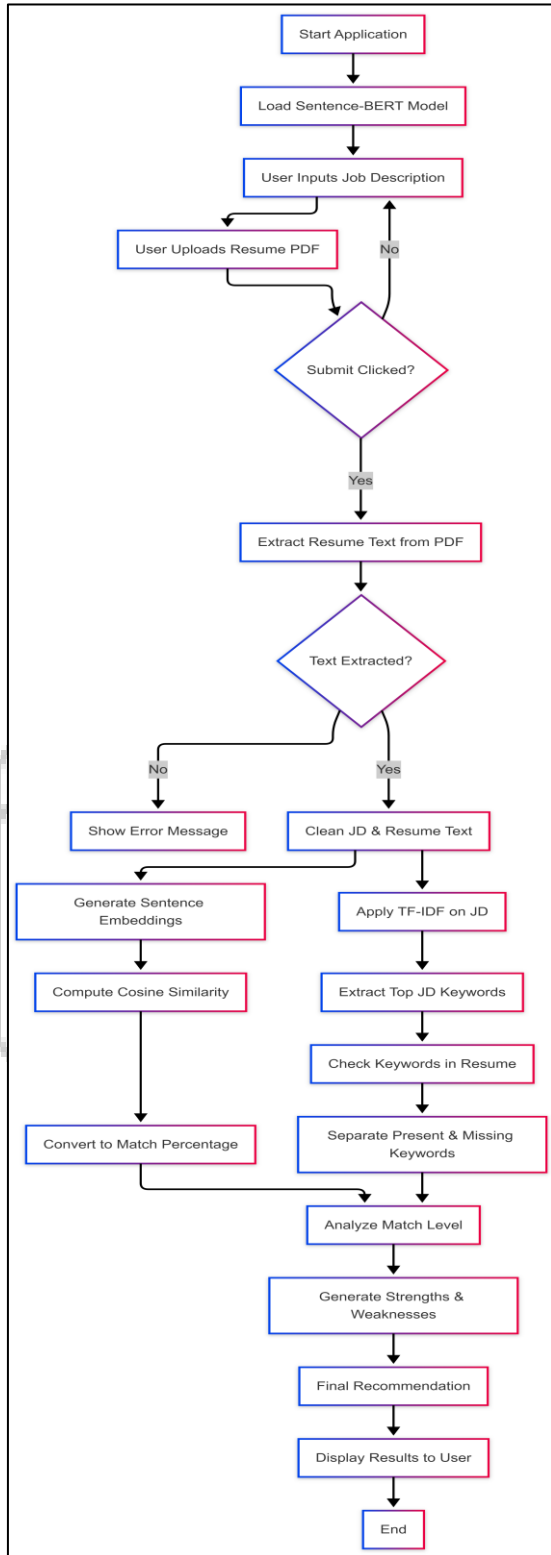


Fig. 1: Resume Screening Architecture

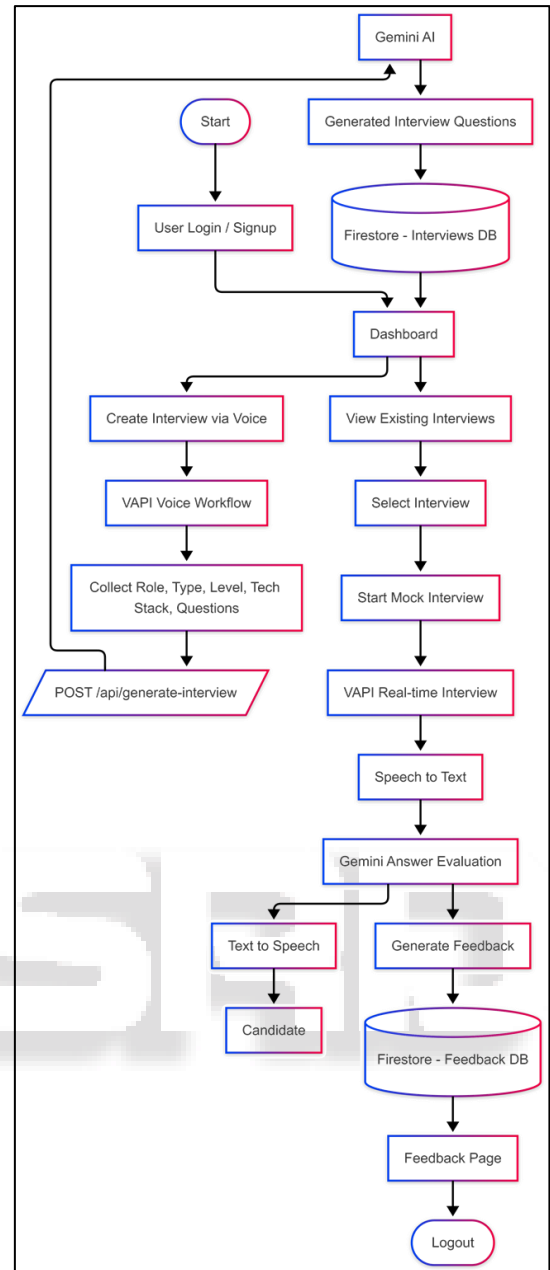


Fig. 2: Interview Assistance Architecture

### IV. METHODOLOGY

The proposed system, *AI-Powered Resume Screening and Interview Assistant*, integrates advanced BERT (Bidirectional Encoder Representations from Transformers) Natural Language Processing (NLP) Vapi (Real-time AI voice interviewer) techniques to automate and enhance the candidate evaluation process during recruitment. The Resume Screening model begins with data processing, where unstructured resumes and job descriptions are parsed using tools like Sentence Transformer and PyPDF2. Key details such as skills, education, and work experience are extracted using tokenization, lemmatization, and Named Entity Recognition (NER) which are one of the models of the Machine Learning. Following this, text data is converted into numerical vectors format using Term Frequency–Inverse Document Frequency (TF-IDF) and contextual embeddings or giving a word meaning on the basis of the surrounding

words from Bidirectional Encoder Representations from Transformers (BERT). These vectors are compared and matched with job descriptions using Cosine Similarity(it is a way to measure how the two things are similar to each other) to determine the similarities of each resume, which allows for accurate ranking of candidates. The model also provides automated suggestions for resume improvement by identifying gaps in required skills or keywords as per the job description.

The proposed system follows a structured pipeline to conduct AI-based mock interviews and generate automated feedback. First, the user authenticates using secure email-based login, and session management is handled using server-side cookies. After authentication, the user initiates interview creation through a conversational voice interface. The system collects interview parameters such as job role, experience level, and technology stack using a real-time AI voice agent. These inputs are sent to a backend API, where a large language model generates personalized interview questions. The interview is then conducted in real time, with the AI agent asking questions and recording the candidate’s spoken responses. All responses are transcribed into text and stored securely in the database. After the interview session ends, the transcript is analyzed using natural language processing techniques to evaluate answer relevance, clarity, and alignment with job requirements. Based on this analysis, structured feedback including performance scores, strengths, and areas for improvement is generated and displayed to the user.

## V. RESULT & DISCUSSION

### A. AI-Powered Resume Screening:

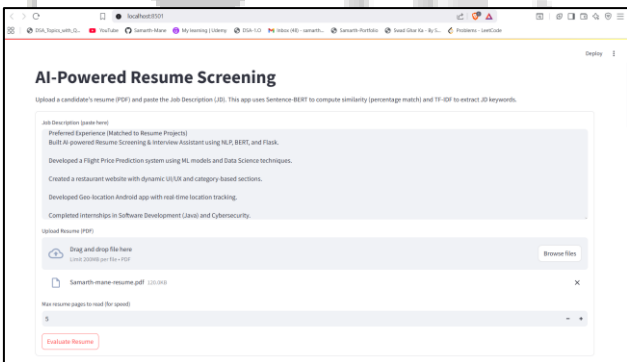


Fig. 3: User Interface for Resume Upload and Job Description Entry

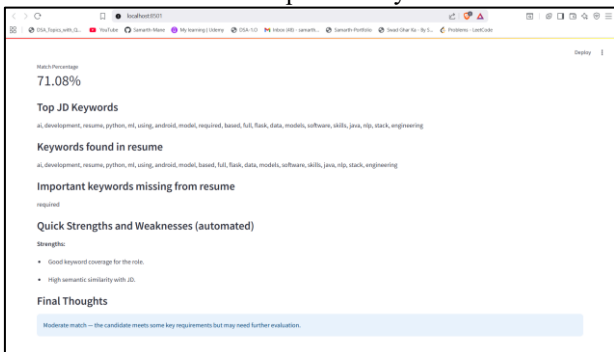


Fig. 5: Final Resume–Job Description Match Score Output

The AI-powered resume screening module effectively evaluates resumes by comparing them with the job description and generating a match score. It extracts relevant keywords, identifies missing skills, and highlights strengths and weaknesses of the candidate. This result demonstrates the system’s ability to provide clear, objective, and actionable insights to improve resume relevance and support efficient shortlisting.

### B. Interview Assistant: -

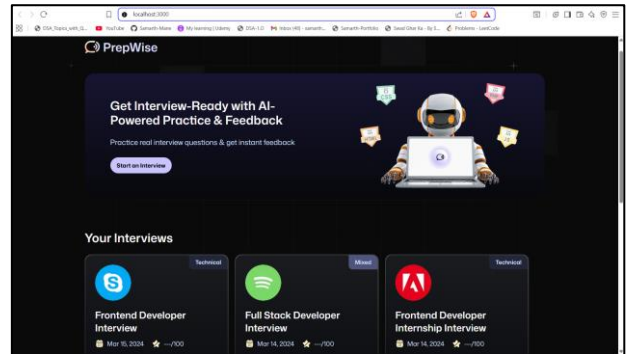


Fig. 7: Home Page

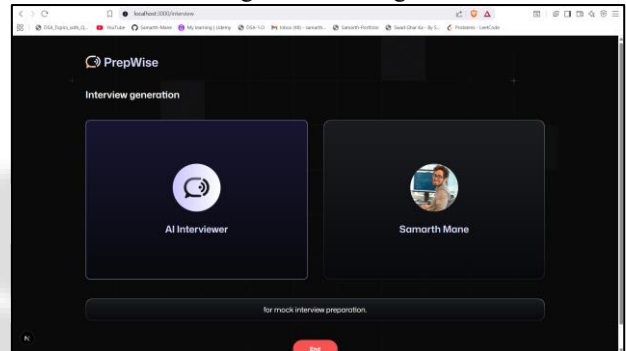


Fig. 8: Virtual Interview Session Interface

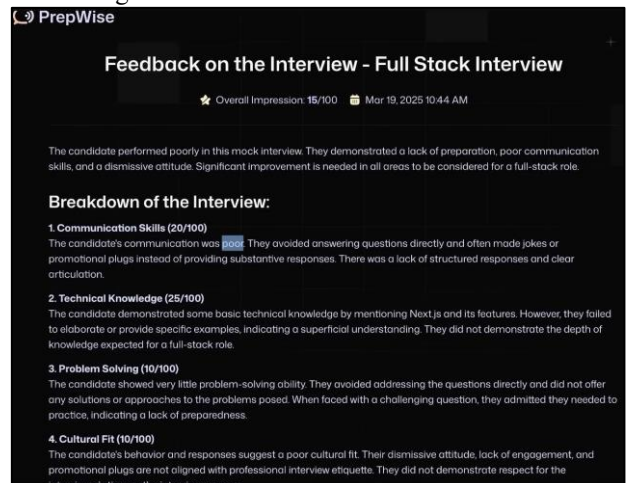


Fig. 9: Automated Interview Feedback Generated by the Interview Assistant

The interview assistant generates detailed, category-wise feedback after each mock interview, evaluating communication skills, technical knowledge, problem-solving ability, and professional behavior with clear scores and remarks. It also provides an interactive interview initiation interface, enabling seamless real-time AI–candidate interaction for conducting full-stack mock interviews.

## VI. CONCLUSION AND FUTURE SCOPE

The proposed project, *AI-Powered Resume Screening and Interview Assistant*, addresses challenges faced in traditional recruitment systems by combining intelligent resume screening, semantic job matching, and AI-driven mock interviews into a single platform. There are many existing systems that focus only on resume filtering or basic keyword matching, our system adds new features that helps to evaluate candidate better and make things easier for users. Most importantly, we have integrated speech emotion recognition to get to know candidates confidence and emotional tone during interviews that are not or rarely found in current existing systems. Furthermore, our system uses smart transformer models that understand the situation to create questions that change based on the resume. personalized interview questions based on resume content, which gives more realistic feel of real-world interviews. We also have introduced semantic answer evaluation using Sentence-BERT, which allows deeper assessment of candidate responses beyond surface-level keyword matching. These enhancements collectively make the system more robust, interactive, and effective in screening potential candidates. Our project brings together advanced AI and real hiring needs to create a smart assistant that helps in finding the right talent, faster, and more accurate.

In the future, the system can be improved by adding personality analysis using video interviews, supporting resumes in different languages, and giving instant feedback. Model could also be linked to popular job websites to make the whole hiring process easier and faster.

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