

Gen AI: Development Of An AI-Driven System For Personalized Job Matching And Career Pathing

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Abstract: The rapid growth of job opportunities and the increasing number of applicants pose challenges in the recruitment process, both for employers and job seekers. This paper, "AI-Driven Resume Analysis and Skill-Based Job Recommendation System with Admin and Student Module", aims to streamline the recruitment process by leveraging artificial intelligence and natural language processing techniques. The system provides two distinct modules: an Admin Module and a Student Module. In the Admin Module, recruiters can post job openings, view uploaded resumes, and analyse them to identify the most suitable candidates based on the relevance of skills and qualifications. In the Student Module, users can upload their resumes, which are automatically recommended jobs that match the candidates' skills, enabling students to apply for positions that best fit their profile. This approach minimizes manual effort in shortlisting resumes, increases the efficiency of recruitment, and improves the chances of students finding relevant job opportunities. The paper also provides statistical insights to admins, such as the number of applications per job and the most relevant resumes, thereby supporting data-driven recruitment decisions. Overall, the system combines AI-driven resume analysis, skill extraction, and job matching to create an intelligent, user-friendly, and effective recruitment platform.

Keywords: AI-Based Recruitment, Resume Analysis, Skill Extraction, Job Recommendation System, Natural Language Processing (NLP), Machine Learning, Intelligent Job Portal.

I. INTRODUCTION

In today's highly competitive job market, identifying suitable employment opportunities that align with an individual's skills, qualifications, and career goals has become increasingly challenging. Traditional job search methods often rely on keyword matching and manual resume screening, which are time-consuming, inefficient, and prone to human bias. To address these limitations, the AI-Driven Resume Analysis and Skill-Based Job Recommendation System with Admin and Student Modules is designed to automate resume evaluation and provide intelligent job recommendations using advanced artificial intelligence and machine learning techniques. The system analyzes student resumes to extract key information such as skills, education, experience, and certifications, and matches them with relevant job opportunities based on skill compatibility rather than generic job titles. The student module enables users to upload resumes, view analyzed results, and receive personalized job recommendations, while the admin module allows administrators to manage job postings, monitor system performance, and maintain data accuracy. By leveraging AI-driven analytics, this system enhances recruitment efficiency, reduces bias, and supports students in making informed career decisions through accurate and personalized job recommendations.

By leveraging Natural Language Processing (NLP), the platform goes beyond surface-level text to understand the context and proficiency levels of a candidate's expertise. This ensures that the recommendations are not just relevant, but highly specialized to the student's unique professional trajectory. The student interface further serves as a career

development hub, providing a "Compatibility Score" for various roles which highlights specific areas where the user might need additional training or certifications. This transparency empowers students to take a proactive approach to their employability, transforming the job search from a guessing game into a data-driven strategy for success.

Simultaneously, the admin module provides recruiters and institutional headers with powerful oversight, allowing them to track placement trends and identify skill gaps within the talent pool. This macro-level data is invaluable for educational institutions looking to align their curriculum with the shifting demands of the global economy. By automating the heavy lifting of initial screenings, administrators can focus on high-level strategy and candidate engagement rather than manual data entry. Ultimately, this AI-driven ecosystem fosters a more equitable hiring environment by stripping away unconscious bias and focusing strictly on merit and capability. increasingly precise bridge between academic potential and professional excellence, ensuring that the right talent finds the right opportunity at the right time.

Natural Language Processing to automate skill extraction and provide personalized job recommendations, thereby reducing manual effort and improving the hiring process.

II. LITERATURE SURVEY

A. NLP-Based Resume Analysis, Skill Enhancement & Job Automation

G. Krishna Lohith (2025) proposed NLP-Based Resume Analysis, Skill Enhancement & Job Automation, which uses NLP to extract the text and analyze it to help users provide insights. It suggests some skills to work on and some course recommendations which helps him level up. Through resume matching with job descriptions, NLP is able to detect skill gaps and suggest tailored training programs to improve candidates' qualifications and make them more hireable. In this paper, we examine a few contemporary methods for screening automated resumes. To increase the precision and effectiveness of the screening process, these approaches employ a variety of methods including hybrid deep learning frameworks, transfer learning, genetic algorithms, and multisource data. Also, some research investigates the use of job descriptions to improve resume screening precision. This technology helps recruiters reduce the workload; it helps simplify recruiters' work and find the person who matches their criteria. NLP does more than just analyze resumes. It helps automate jobs with real-time suggestions and resume optimization assistance, along with candidate matching to suitable job positions. AI-powered chatbots and virtual assistants can suggest resume improvements, suggest certificates, and help candidates in applying.

B. AI Resume Analyzer

Ashvini Chavan(2024) proposed the contemporary landscape of employment, where the intersection of technology and workforce dynamics continually evolves, the "AI Resume Analyzer" emerges as a pioneering tool aimed at simplifying and enhancing the job-seeking process. With an emphasis on professionalism and innovation, this paper represents a significant step forward in the domain of career placement and human resources. User engagement initiates with a robust registration and authentication process, ensuring security to our platform. The crux of our AI Resume Analyzer is its job recommendation engine. With an intricate blend of collaborative filtering, content-based filtering, and hybrid recommender systems, it presents job opportunities that are a seamless fit with a candidate's skills and experience. This recommendation system operates dynamically to adapt to the ever changing job market, ensuring that the job opportunities presented remain relevant and reflective of the contemporary industry landscape.

C. AI-Powered Resume Analyzer

Dhruv Garg (2025) proposed The recruitment industry is rapidly evolving with the integration of Artificial Intelligence (AI), especially in resume screening and job matching. Traditional hiring methods are often inefficient and biased, relying heavily on manual resume reviews. This research addresses these challenges using AI-driven resume analysis

with Natural Language Processing (NLP) techniques like spaCy, TF-IDF, and Cosine Similarity. Job descriptions and resumes are manually collected, and spaCy's Named Entity Recognition (NER) is used to extract key skills and job titles. TF-IDF and Cosine Similarity then evaluate the match between resumes and job descriptions. This ensures an objective, data-driven, and accurate matching process. The expected outcome is a more efficient, fair, and automated hiring workflow.

III. PROPOSED METHOD

An AI-driven recruitment platform streamlines the hiring process by integrating both Admin and Student modules to efficiently manage job postings, resumes, and applications. The system leverages advanced Natural Language Processing (NLP) and Large Language Models (LLMs) to automatically extract key information such as skills, education, and experience from resumes, significantly reducing manual effort. It also enhances communication by enabling automated email updates and feedback between administrators and candidates, minimizing the need for manual status tracking. Additionally, the platform supports real-time interaction through a pre-trained chatbot, which provides instant suggestions for resume improvement and recommends relevant certifications, helping candidates enhance their profiles effectively.

IV. MODULES

A. USER MODULE

The User Module serves as the primary entry point for candidates, focusing on secure profile management and authentication. Built using the Django Authentication System, it allows students to create accounts, manage personal details, and track their application history. The module implements CSRF protection and password hashing to ensure that sensitive user data remains secure. Upon logging in, users are directed to a personalized dashboard that summarizes their uploaded resumes and current job matches. This module also handles the "Password Reset" and "Profile Update" functionalities through dedicated Django forms. Technically, it maps directly to the D1 (User Profile Database) seen in the data flow diagrams. By maintaining a clean separation of user roles, it ensures that students only access features relevant to their job search.



Figure 1: User Module.

B. LLM ANALYSER

The LLM Analyzer acts as the "intelligence layer" of the system, transforming raw text into structured professional insights. It utilizes Large Language Models (such as Gemini or OpenAI via API) to perform deep semantic analysis of the extracted resume text. Unlike traditional parsers, it can identify implicit skills and categorize experience levels based on the context of the writing. By moving beyond simple keyword matching, the LLM ensures that a "Frontend Developer" is matched with "React" roles even if the exact keyword is missing. It also evaluates the "tone" and "professionalism" of the resume to provide a comprehensive candidate score.

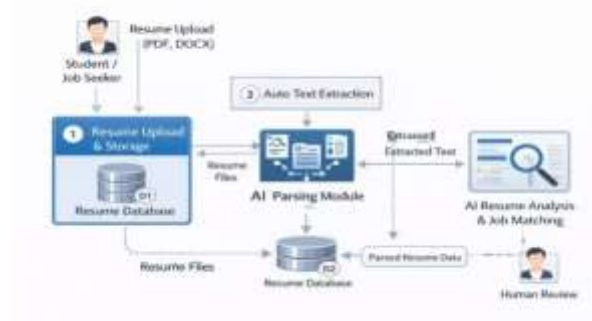


Figure 2: LLM ANALYSER

C. JOB PORTAL

The Job Portal module functions as the bridge between the candidate's parsed data and the available market opportunities. It queries the D4 (Job Database) to display active openings that align with the user's identified skill set. The portal features a "Smart Search" bar and filters for location, role type, and salary range to enhance the user experience. Behind the scenes, the Job Recommendation Engine calculates a similarity score between the user's profile and each job description. Jobs are then displayed in a ranked list, with the most relevant positions appearing at the top of the feed. Each job listing provides a detailed breakdown of why the user was matched, highlighting "Missing Skills" for

further improvement. The portal also includes a "One-Click Apply" feature that links the user's analyzed profile to the recruiter's dashboard.



Figure 3: Job Portal

D. CHATBOAT

The Chatbot Module offers an interactive, real-time support layer designed to guide students through resume optimization and career planning. Powered by a pre-trained Conversational AI model, it can answer specific questions like "How can I improve my Python score?" or "What certifications are trending for UI/UX?" The chatbot accesses the user's Parsed Resume Data to provide context-aware suggestions tailored to their specific background. It functions as a 24/7 career counsellor, reducing the need for manual support from system administrators. Technically, the module uses a "query-response" loop where user input is analysed for intent before a structured answer is generated. The chatbot is embedded across all pages of the portal, ensuring assistance is always one click away. It also helps users navigate the platform's features, such as finding where to update their skills or view their match history. This module significantly enhances the "Usability Aspect" of the implementation.

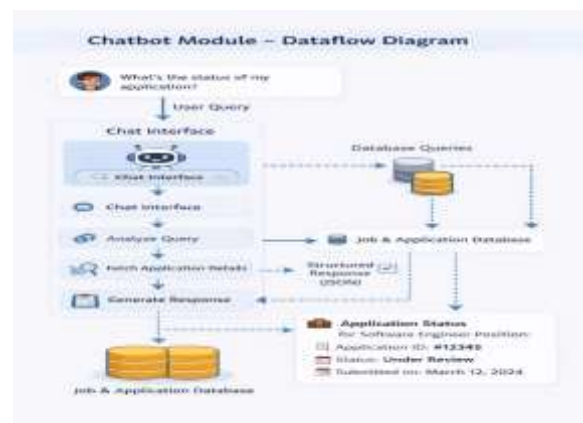


Figure 4: ChatBot Module

E. ADMIN MODULE

The Admin Module provides recruiters and system managers with a powerful dashboard to oversee the entire hiring lifecycle. From this interface, admins can Post New Jobs, edit existing descriptions, and set the "Required Skill" weights for the matching algorithm. The module provides a "Candidate Ranking View," where recruiters can see an AI-sorted list of applicants for any specific role. Admins have access to Data Visualization tools that show application trends, common skill gaps, and system performance metrics. It also includes tools for "Model Training," allowing admins to provide feedback on match quality to refine the LLM's accuracy. Secure access is strictly controlled, ensuring that only authorized personnel can view sensitive candidate resumes. Automated scripts handle Database Migration to move the local schema to a production-grade SQL database like PostgreSQL or MySQL. Static files and media (resumes) are moved to a distributed storage system like Amazon S3 to prevent server bloat. SSL certificates are installed to provide an HTTPS connection, ensuring all data transfers between the client and server are encrypted.



Figure 5: Admin Module

V CONCLUSION

The development of the AI-Powered Job Portal represents a significant advancement in modern recruitment technology, successfully bridging the gap between aspiring candidates and top-tier organizations. By leveraging cutting-edge automation, the platform transforms the traditional, often tedious job search into a streamlined, data-driven experience that prioritizes user intent and professional compatibility. The integration of the AI Chatbot ensures that users receive instantaneous support, while the AI-Powered Resume Analyzer provides objective "Match Scores" that help candidates understand their standing in a competitive market. From an administrative perspective, the Admin Dashboard offers a comprehensive command center, allowing for the efficient management of thousands of job postings and user profiles with real-time analytical oversight.

The successful deployment of features like the Company Search and Jobs Dashboard proves that a well-structured digital marketplace can significantly reduce the "time-to-hire" metric for companies. As the job market continues to evolve, this portal provides a scalable foundation that can adapt to the changing needs of both employers and job seekers globally.

As organizations face growing skill scarcity, these portals utilize predictive analytics to forecast talent needs and match them with qualified candidates proactively. The shift toward a "skills-first" hiring approach, prioritized by over 70% of employers by 2026, means that the portal's ability to assess cognitive abilities, soft skills, and behavioral traits through AI assessments is becoming indispensable.

VI FUTURE SCOPE

- **Native Mobile Applications:** Developing dedicated iOS and Android apps to provide real-time push notifications for job alerts and application status updates.
- **Blockchain Credential Verification:** Utilizing blockchain technology to verify educational degrees and work experience, virtually eliminating resume fraud.
- **Multilingual AI Chatbot:** Expanding the chatbot's natural language processing capabilities to support multiple global and regional languages for a diverse workforce.
- **Video Interview Integration:** Incorporating an in-built video conferencing tool with **AI-driven sentiment analysis** to evaluate candidate communication and confidence.

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