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AI-Based Job Recommendation System Using Skill Extract & Matching

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Abstract: ***The conventional job search process tends to be disjointed, leaving job seekers confused by non-relevant job postings and hiring managers drowning in the manual processing of resumes. This study proposes the concept of an AI-Enabled Job Portal, an all-encompassing platform that aims to close the gap between qualified individuals and available opportunities through Intelligent Matching Algorithms and Natural Language Processing (NLP). Unlike conventional job portals, this platform includes an integrated AI-powered resume parser, job recommendation engines, and a centralized dashboard for both job seekers and employers. Through the application of semantic intent as opposed to keyword searching, the portal guarantees improved resume placement accuracy and a faster hiring process.***
Keywords: AI-Enabled Job Portal, Skill-Based Recommendation Engine, Automated Recruitment Pipeline, Intelligent Talent Acquisition, Semantic Profile Evaluation

I. INTRODUCTION

The digital evolution of the job market has resulted in an explosion of job information, but the problem of finding the "right fit" still persists. The existing portals are largely passive repositories, and the filtering process is extremely manual for both sides. We would like to introduce the concept of an Intelligent Job Portal that plays the role of an active facilitator. Using the capabilities of Generative AI and scoring systems, this portal will not only display job information but also evaluate candidate profiles against the requirement

II. LITERATURE SURVEY

Early recruitment systems mainly depended on Boolean search queries and manual classification to filter candidates based on keywords and predefined categories. Although these methods helped in basic candidate screening, they lacked the ability to understand the actual context of resumes and job descriptions, which often resulted in inefficient candidate-job matching [1].With the growth of digital recruitment platforms, Machine Learning techniques were introduced to improve candidate ranking and resume analysis. These systems helped automate the screening process by analyzing candidate skills and qualifications. However, many of these models operated as black-box algorithms, offering limited transparency in how decisions were made during the recruitment process [2].

To improve semantic understanding, modern recruitment systems started using Natural Language Processing (NLP) techniques. Models such as BERT improved the ability of systems to understand contextual relationships between words in resumes and job descriptions, which significantly enhanced the accuracy of candidate matching [3].At the infrastructure level, scalable databases such as MongoDB have been widely used to manage large volumes of recruitment data including candidate profiles, job postings, and application records, ensuring flexibility and efficient data management in modern job portal systems [4].Recently, Large Language Models (LLMs) have further enhanced recruitment systems by enabling deeper contextual analysis, skill extraction, and intelligent candidate evaluation. These models help improve the overall efficiency and accuracy of recruitment processes [5].Additionally, modern web frameworks such as React support the development of responsive and interactive dashboards, allowing recruiters to efficiently manage job postings and candidate data through user-friendly interfaces [6].These advancements highlight the importance of integrating AI, NLP, and modern web technologies to develop an intelligent recruitment system capable of improving candidate-job matching and recruitment efficiency.

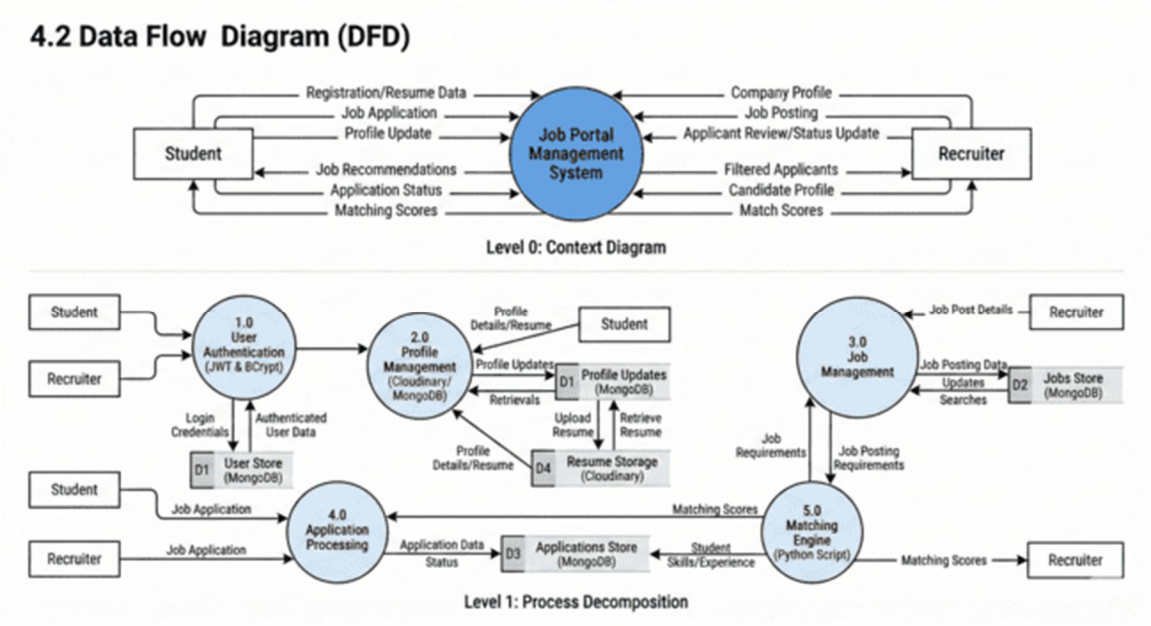
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III. PROBLEM STATEMENT

"Traditional recruitment methods involve superficial keyword filtering, which often results in subjective bias and a large number of irrelevant results for the recruiter. The current state of recruitment platforms does not involve automated normalization of academic credentials and does not verify practical skills by external traces such as GitHub, resulting in a trust issue in the recruitment process. This project proposes an AI-assisted ecosystem that offers transparent and skill-based recommendations to facilitate recruitment in the field of IT and Medical."

IV. SYSTEM ARCHITECTURE



The proposed system architecture integrates students and recruiters through a centralized AI-enabled job portal. It includes modules for user authentication, profile management, job management, application processing, and an AI-based matching engine. Students can create profiles, upload resumes, and apply for jobs, while recruiters can post job openings and review candidates. The matching engine analyzes candidate skills and job requirements to generate matching scores and provide relevant job recommendations. This architecture ensures an efficient and automated recruitment process.

V. METHODOLOGY

A. Data Collection and Integration

The proposed AI-enabled job portal is designed to collect and integrate information from two primary sources: recruiters and job seekers. Recruiters upload job descriptions that include required skills, qualifications, experience, and job roles. At the same time, candidates upload their resumes and provide additional details such as education, technical skills, projects, internships, and career objectives. The system ensures that both inputs are stored in a structured format within the database. This synchronized data environment enables the system to perform accurate and efficient matching between candidate profiles and job requirements.

B. Resume and Job Description Processing

Since resumes and job descriptions are usually available in unstructured textual form, the system applies Natural Language Processing (NLP) techniques to extract meaningful information. Initially, the text is cleaned by removing unnecessary symbols and irrelevant words. Then, tokenization is performed to break the text into individual words, followed by lemmatization to convert words into their base form. This process helps in identifying important professional attributes such as skills, technologies, education, and experience. These extracted features are then converted into a structured format so that the system can easily compare candidate profiles with job requirements.

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C. Skill Verification and Profile Evaluation

After extracting the relevant information, the system evaluates the candidate's profile based on multiple parameters. Technical skills mentioned in the resume are analyzed and compared with project details and practical work. If the candidate provides a GitHub profile, the system verifies their technical expertise by checking repositories, contributions, and project activity. Academic performance is also considered by converting CGPA into percentage using standard academic normalization. Internship experience and project work are evaluated to understand the candidate's practical exposure. This process helps in validating the authenticity and strength of the candidate's profile.

D. Job Matching and Recommendation

The system uses an intelligent matching mechanism to recommend suitable jobs for candidates. It compares candidate qualifications, skills, and experience with job requirements. Based on this comparison, the system calculates a Job-Match Score, which indicates how well the candidate fits a particular job role. Candidates with higher scores are ranked higher and recommended to recruiters. Similarly, candidates receive job recommendations that closely match their profiles. This automated process reduces manual effort and improves the efficiency and accuracy of recruitment.

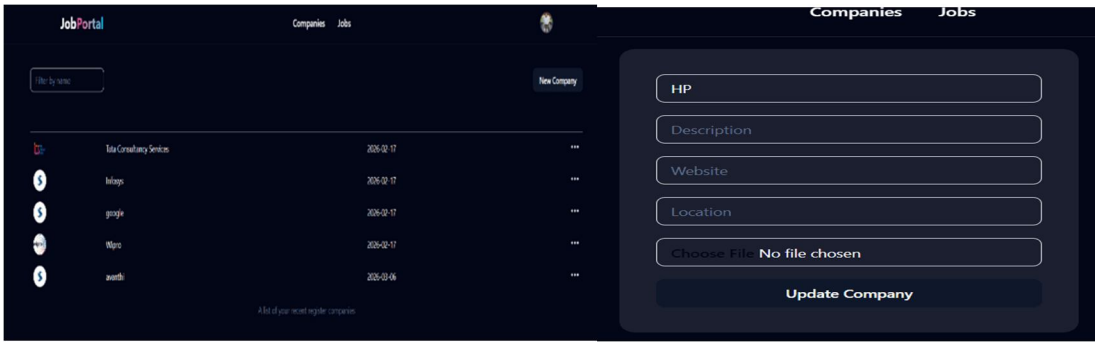
VI. TECHNOLOGY STACK

The system is developed using React.js for the frontend and Node.js with Express.js for the backend. MongoDB is used as the database for storing user and job information. Natural Language Processing techniques using Python libraries such as NLTK and Scikit-learn are used for resume analysis and job matching. Git and GitHub are used for version control, and the system is deployed using cloud platforms such as render and versal

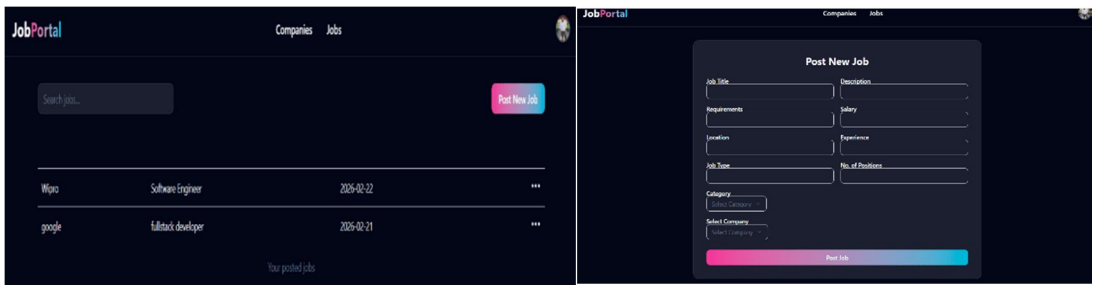
VII. INPUT & RESULT

A. Input

1) Recruiter Dashboard

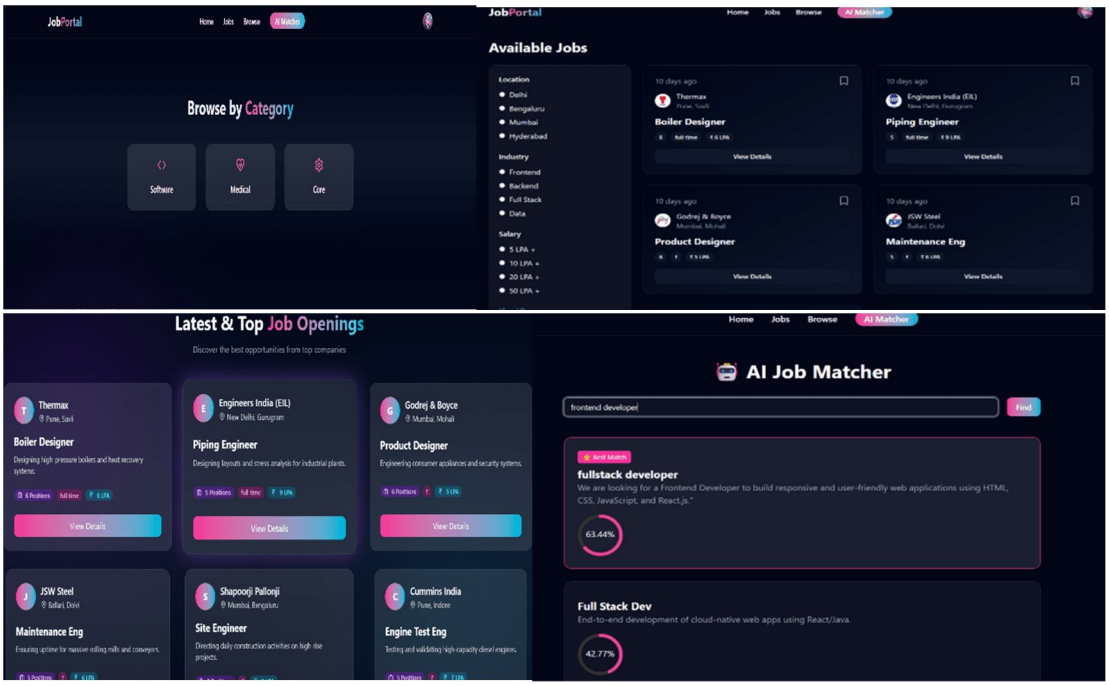


The system provides an intuitive interface for managing company information within the job portal. Administrators can easily add, update, and view registered companies through a structured dashboard. The platform allows organizations to store essential details such as company name, description, website, location, and logo. A search and filter feature is also integrated to quickly locate specific companies. This functionality simplifies company management and ensures efficient organization of recruitment data within the portal.



The system provides a dedicated interface for recruiters to post and manage job opportunities efficiently. Recruiters can enter important job details such as title, description, requirements, salary, experience, job type, and location through a structured form. The platform also allows selection of company and job category to properly organize job listings. Once submitted, the posted jobs are displayed in a dashboard where recruiters can easily view and manage them. This module simplifies the job posting process and ensures structured management of available opportunities within the portal.

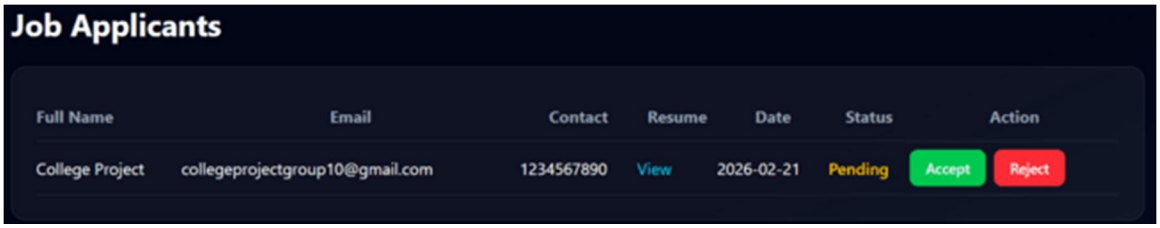
2) Student Dashboard



The job portal provides multiple intelligent methods for candidates to discover relevant job opportunities. Users can explore available positions by browsing different job categories such as software, medical, and core industries. The system also offers filtering options based on location, industry, and salary to help users quickly identify suitable jobs. A dedicated section displays the latest and top job openings from various companies to keep candidates updated with recent opportunities. Additionally, the AI Job Matcher analyzes the user's input skills or job preferences and recommends the most relevant positions along with a matching score. This intelligent approach improves job discovery and helps candidates find opportunities that closely align with their skills and interests.

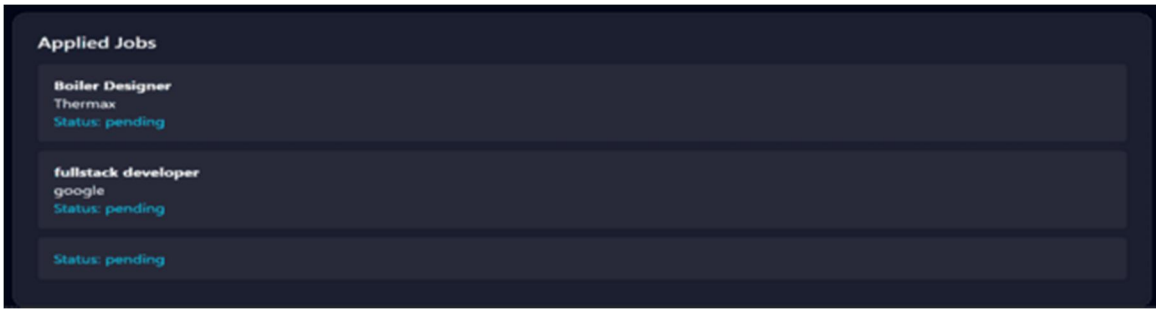
B. Result

1) Recruiter result



The system provides a recruiter dashboard where employers can view candidates who have applied for a job. Recruiters can access important applicant details such as name, email, contact number, and resume. The platform allows recruiters to review each candidate's profile and application date easily. Additionally, recruiters can manage the recruitment process by accepting or rejecting applicants directly from the interface. This feature simplifies applicant tracking and improves recruitment efficiency.

2) Student Result



The system provides a profile section where candidates can view the jobs they have applied for. Users can easily track the application status of each job in real time. The platform displays details such as job title, company name, and the current application status. This feature helps candidates stay informed about the progress of their applications. It improves transparency and allows users to manage their job applications efficiently.

VIII. ADAVTAGES

The proposed AI-enabled job portal offers several benefits that improve the recruitment process. It provides skill-based job recommendations by analyzing candidate skills, education, and project experience, which helps candidates find more relevant job opportunities. The system reduces manual effort by automatically analyzing resumes and ranking candidates using the Job-Match Score, allowing recruiters to quickly identify suitable candidates. It also improves the accuracy and fairness of candidate selection by evaluating profiles based on multiple factors. In addition, the user-friendly interface makes it easy for both recruiters and job seekers to use the system efficiently. Overall, the system saves time, improves matching accuracy, and makes the hiring process more effective

IX. FUTURE SCOPE

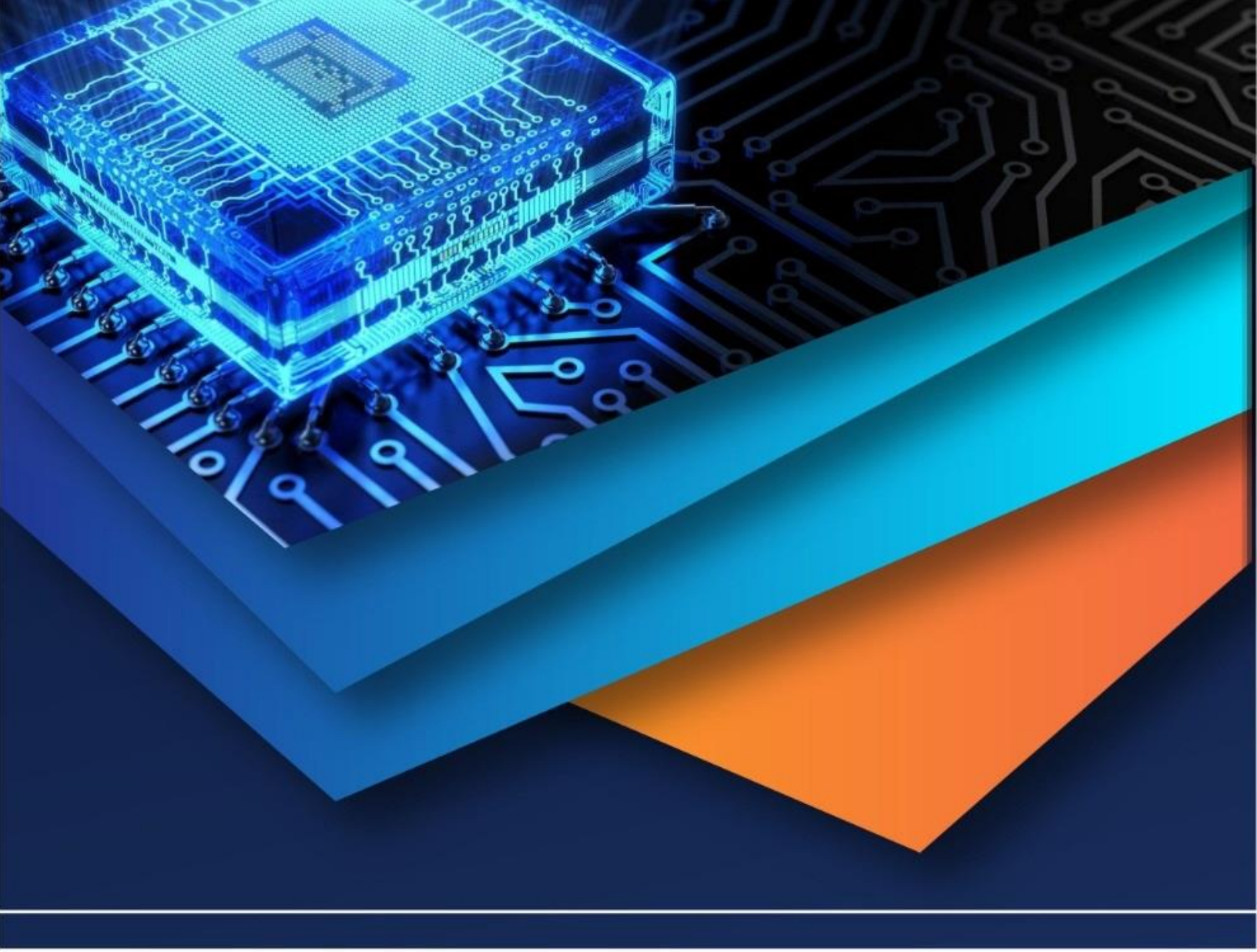
The proposed system can be further improved by integrating more advanced Artificial Intelligence techniques to increase matching accuracy. Features such as real-time interview scheduling, online skill assessment tests, and video resume analysis can be added. The system can also be expanded to support more job sectors beyond IT and medical. In addition, integrating mobile application support and providing personalized career guidance can further enhance user experience and system effectiveness.

X. CONCLUSION

The AI-enabled job portal was successfully developed to provide skill-based job recommendations and intelligent candidate matching. The system uses Artificial Intelligence and Natural Language Processing techniques to analyze resumes and match candidates with suitable jobs. It reduces manual effort, improves recruitment efficiency, and provides accurate job recommendations. The proposed system helps both recruiters and job seekers by making the hiring process faster, easier, and more effective.

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