Semantic AI-Powered Resume Analyzer and Job Recommendation System with Cloud Deployment

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Abstract: *In today's highly competitive job market, job seekers often face the challenge of navigating through overwhelming volumes of job postings, many of which may not align with their qualifications or career goals. Traditional job portals rely heavily on manual search and keyword matching, resulting in inefficient and time consuming job hunting processes. Additionally, the lack of personalized recommendations often leads to missed opportunities and poor job-to-candidate matching, especially for individuals with specialized skills or unique career paths. This project introduces an AI-based job recommendation system designed to address these challenges by offering intelligent, personalized job suggestions. Users can register and upload their resumes, which are securely stored in a centralized database. A dedicated resume analysis module leverages a Multi-Layer Perceptron (MLP) model to interpret the user's qualifications, experience, and skills. The system then compares this data with job listings uploaded by employers to identify the most relevant opportunities. By automating the matching process and delivering real-time job alerts, the system significantly enhances the job search experience. It reduces the effort required to find suitable positions while increasing the chances of securing relevant employment. This AI-driven solution not only streamlines recruitment but also bridges the gap between job seekers and employers, promoting faster and more effective employment outcomes.*

Keywords: AI Resume Analysis, MLP

I. INTRODUCTION

The AI-based job recommendation system presents a transformative approach to modern recruitment by utilizing artificial intelligence to bridge the gap between job seekers and employers. As traditional job portals often rely on basic keyword searches and static filtering, they fail to deliver personalized job suggestions, leaving users to manually sift through countless irrelevant listings. This system addresses such inefficiencies by leveraging deep learning models to intelligently analyze resumes and match them with suitable job opportunities. The system allows users to register and upload their resumes, which are then processed and stored in a centralized database. A Multi-Layer Perceptron (MLP) model is used to analyze the skills, qualifications, and experiences of the candidates, comparing them with dynamic job listings provided by employers. Based on this analysis, the system sends personalized job notifications to the users, drastically improving the relevance and timeliness of the recommendations. By automating and personalizing the job-matching process, the system enhances user experience, reduces job search time, and increases placement efficiency. It not only assists job seekers in finding opportunities that truly align with their career goals but also aids employers in reaching the most suitable candidates quickly, thereby streamlining the entire recruitment ecosystem.

II. MLP

The primary objective of this project is to develop an AI-based job recommendation system that intelligently bridges the gap between job seekers and relevant employment opportunities. By leveraging machine learning techniques, specifically a Multi-Layer Perceptron (MLP) model, the system aims to enhance the traditional job-hunting experience with intelligent, data driven decision-making. The system processes user resumes, identifies key skills, and dynamically matches them to job listings, ensuring a higher degree of relevance and personalization. A critical goal is to automate

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resume analysis and reduce the burden of manual job searching. The system extracts key information from uploaded resumes and evaluates them against a continuously updated database of job postings. Based on the analysis, it sends timely job alerts to users whose profiles align with available positions. This improves the overall user experience by delivering focused results tailored to the individual's qualifications and career goal.

III.EXISTING SYSTEM

• Manual Resume Screening

Recruiters or HR personnel read and evaluate each resume manually to check for qualifications, experience, and relevance to job roles. This is accurate in understanding human context but very time-consuming, prone to bias, and not scalable for large applicant pools.

• Job Portals with Basic Filters

Websites like Indeed or Monster allow users to apply filters such as location, job title, experience level, and salary. These platforms match users to jobs based on selected criteria rather than intelligent analysis. It's user controlled but lacks automation and smart recommendations.

IV. PROPOSED SYSTEM

The proposed system is an AI-driven platform designed to streamline the job search process by automating the resume analysis and job matching process.Job seekers first register and upload their resumes, which are stored in a centralized database. The system then leverages a Multi-Layer Perceptron (MLP) model to analyze the resume data, extracting key details such as skills, qualifications, experience, and job preferences. This data is then matched with job listings provided by companies. The AI model continuously learns from the collected data, enabling it to refine its matching algorithm and improve the accuracy of job suggestions over time. As a result, job seekers receive personalized job alerts tailored to their profile, allowing them to apply for positions that are the best fit for their experience and career goals. Companies can also contribute by adding or updating job listings, ensuring that the platform remains up-to-date with current vacancies. The system's intelligent nature makes the job search process more efficient by reducing the time and effort required to find relevant job opportunities. By continuously improving its matching capabilities, the AI-powered platform provides a smarter, faster, and more effective job search experience for both job seekers and employers.

V. SYSTEM ARCHITECTURE DIAGRAM
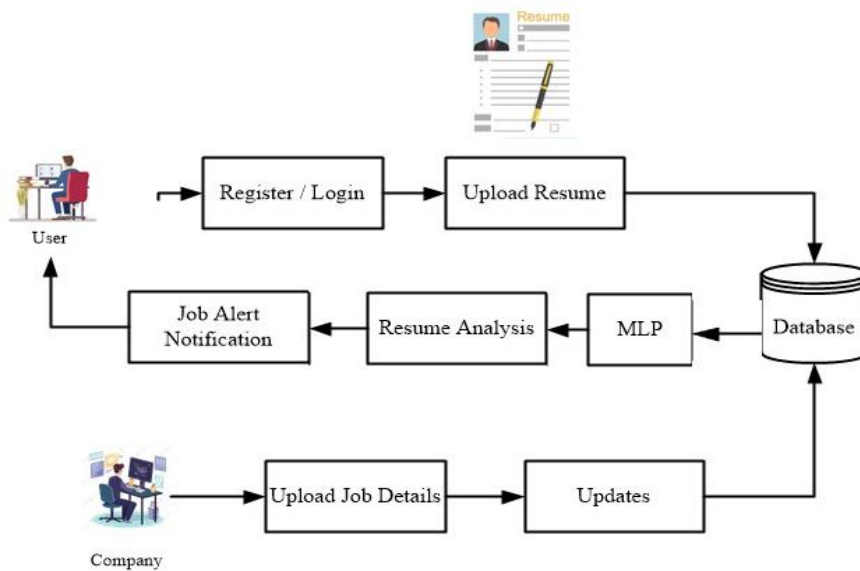
VI. MODULES

List of Modules:
- User Management Module
- Machine Learning Processing Module
- Job Management Module
- Notification Module

User Management Module:

This module ensures that job seekers and employers can register, manage their profiles, and upload resumes securely. It handles the authentication process by providing user registration and login functionality, with strong encryption to protect sensitive data. Users can create and update personal profiles, including contact information, skills, experience, and other details relevant for job matching. The system also allows job seekers to upload their resumes in various formats, which are stored in a secure database for further analysis by the AI model. Profile management ensures that users can update their information as needed, providing them with a personalized experience.

Machine Learning Processing (MLP) Module:

The MLP module forms the core of the system, performing resume analysis and job matching. The system uses a Multi-Layer Perceptron (MLP) model to process resumes, extracting relevant features such as qualifications, skills, and job experience. It then compares these features with job listings posted by companies to determine the best matches. The recommendation system offers personalized job alerts, notifying job seekers when a suitable match is found. The machine learning model continuously learns and improves based on user interactions and feedback, optimizing the matching accuracy and providing more relevant job recommendations over time.

Job Management Module:

This module is designed for employers and companies to manage job postings and updates. Employers can register and log in to the system to create new job listings, including role descriptions, qualifications, and location details. The module also allows companies to update existing job posts, ensuring the system reflects the most current opportunities. It supports the addition of new job categories, salary details, and application deadlines, providing flexibility for companies to manage their vacancies effectively. The job management module ensures seamless interaction between job seekers and employers by maintaining an up-to-date list of available positions.

Notification Module:

The Notification Module ensures that users receive timely updates regarding job opportunities and application statuses. Job seekers receive personalized job alert notifications whenever a new position matching their profile is posted or when there are status updates on their applications. Notifications are delivered via both email and SMS, ensuring that users are promptly informed. The system also provides status updates on job applications, helping users track the progress of their job search. The notification system is designed to be intuitive and responsive, keeping both job seekers and employers engaged throughout the job application process.

VII. CONCLUSION

The proposed AI-based job matching system successfully streamlines the job search and recruitment process by leveraging machine learning, particularly a Multi-Layer Perceptron (MLP) model, to intelligently match candidates with relevant job opportunities. By enabling users to upload resumes and receive automated job alerts based on AI-driven analysis, the platform eliminates the need for manual job searching and significantly improves user experience. Simultaneously, companies benefit from an efficient way to manage job listings and reach qualified candidates faster. The system's ability to store, analyze, and continuously learn from resume and job listing data enables adaptive and improved job-candidate pairing over time. This not only enhances matching accuracy but also increases the probability of successful hiring outcomes. Overall, the implementation demonstrates a scalable, user-friendly, and data driven solution that contributes to smarter workforce alignment.

VIII. FUTURE WORK

Implement NLP techniques to better understand the context and semantics of resumes and job descriptions, improving match accuracy. Include analytics dashboards that show job seekers and employers current trends, in-demand skills, and salary benchmarks. Suggest online courses or certifications to job seekers based on the gap between their resumes and job requirements. Develop an AI-powered chatbot to assist users in resume optimization, job application tracking, and answering platform-related queries. Use sentiment analysis on job seeker interactions and employer feedback to refine the system's learning process and improve user satisfaction. Expand the system to support multiple languages and location-based job matching for global scalability. Strengthen data protection using encryption and compliance with GDPR and other data privacy regulations to safeguard user information. Create a cross-platform mobile app to offer accessibility and convenience for users on-the-go.

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