

JOB PORTAL AND RECOMMENDATION SYSTEM

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Abstract

The Job Portal and Recommendation System is a web-based application designed to provide a convenient platform for job seekers and recruiters to connect efficiently. Traditional job searching often requires candidates to manually browse through numerous job postings, making it difficult to identify opportunities that match their skills, qualifications, experience, and career preferences. The proposed system addresses these challenges by combining job portal functionality with an intelligent recommendation mechanism.

The system allows job seekers to register, create profiles, upload resumes, search for jobs, apply for suitable positions, and track application status. Candidates can search and filter jobs based on job title, skills, location, experience, salary, and employment type. Recruiters can create job postings, specify required qualifications and skills, view applications, shortlist candidates, and manage recruitment activities.

The recommendation module analyzes candidate information such as skills, education, experience, preferred location, and job interests and compares it with available job requirements. Based on the similarity between candidate profiles and job postings, the system recommends relevant job opportunities and can generate matching scores. This reduces the effort required to search through a large number of job listings.

I. Introduction

The Job Portal and Recommendation System is a web-based application developed to simplify the process of searching, applying for, and managing job opportunities. In traditional job-searching methods, candidates often need to browse through a large number of job postings manually to find positions that match their skills, qualifications, experience, and career interests. This process can be time-consuming and may result in suitable opportunities being missed.

The proposed system provides a centralized platform where job seekers can register, create profiles, upload resumes, search for jobs, and apply for suitable positions. Candidates can search and filter job opportunities based on job title, skills, location, experience, salary, employment type, and other requirements. They can also track their application status and view their previous applications through their personal dashboard.

Recruiters can use the platform to register, create job postings, define job requirements, view applications, shortlist candidates, and manage recruitment

activities. The system provides recruiters with an organized way to publish vacancies and connect with potential candidates.

The recommendation module analyzes candidate information such as skills, educational qualifications, work experience, preferred location, and job interests. It compares these details with the requirements of available job postings and identifies relevant opportunities. Based on the similarity between candidate profiles and job requirements, the system can generate matching scores and personalized job recommendations.

II. Literature Survey

The Job Portal and Recommendation System is based on research in online recruitment, recommender systems, Natural Language Processing (NLP), machine learning, and intelligent job-matching technologies. Traditional online job portals mainly provide job-search and application facilities, but users may have to examine a large number of job postings manually. Research has therefore focused on developing intelligent systems that can automatically identify relevant job opportunities based on candidate profiles and preferences.

Early job recommender systems primarily used keyword matching and information-retrieval techniques to compare candidate information with job descriptions. These approaches are relatively simple to implement but can have difficulty understanding the semantic relationship between different words describing similar skills or qualifications. As a result, researchers have investigated more advanced similarity and recommendation techniques to improve job relevance.

Content-based filtering has been widely explored for job recommendation. These systems analyze the characteristics of job postings and candidate profiles and recommend opportunities that have similar attributes. Techniques such as TF-IDF, Word2Vec, BERT-based representations, and cosine similarity have been used to compare resumes and job descriptions and generate relevant recommendations.

Collaborative filtering is another important recommendation approach. It uses interactions between users and jobs, such as applications, clicks, views, favorites, or previous selections, to identify patterns and recommend opportunities. However, collaborative approaches can face challenges when new users or new job postings have limited historical interaction data.

Researchers have also developed hybrid recommendation systems that combine content-based and collaborative techniques. These approaches can use both the actual characteristics of candidates and jobs and the behavior of users on the platform. Research reviews show that hybrid approaches have been implemented using machine learning, deep learning, graph-based methods, NLP, and similarity-based algorithms.

Natural Language Processing has become an important technology for resume and job-description analysis. NLP can extract information such as skills, education, job titles, certifications, and experience from unstructured resume documents. The

extracted information can then be converted into structured candidate profiles and compared with job requirements.

Recent research has investigated bidirectional recommendation systems, where the platform recommends suitable jobs to candidates while also recommending potentially suitable candidates to recruiters. Such systems aim to improve both sides of the employment marketplace rather than focusing only on job seekers.

Recent systematic reviews indicate that job recommender systems commonly use similarity-based methods, machine learning models, knowledge-based approaches, and different filtering techniques. Evaluation commonly considers measures such as precision, recall, F1-score, ranking accuracy, and other recommendation-quality metrics.

A 2026 literature review further highlights the importance of representing skills, competencies, job roles, and candidate profiles accurately in AI-based job recommendation systems. It reports that data-driven approaches can provide scalability but may face problems such as dataset bias, limited interpretability, and insufficient semantic understanding. This indicates the importance of building recommendation systems that are both effective and explainable.

Research has also identified fairness and bias as important challenges in job recommendation and recruitment systems. Historical recruitment data can contain biases, and simply removing sensitive attributes may not completely eliminate discriminatory effects. Therefore, modern systems need appropriate evaluation and fairness-aware design.

Another research direction involves personalized job recommendations, where candidate preferences, previous interactions, skills, experience, and career interests are considered when selecting suitable job postings. Personalized recommendations can reduce the number of irrelevant results presented to candidates and make job searching more efficient.

Based on these studies, the proposed Job Portal and Recommendation System combines candidate registration, recruiter management, resume uploading, job posting, NLP-based profile analysis, job search, candidate-job matching, personalized recommendations, application tracking, and notifications in a centralized platform. The system aims to reduce manual job-search effort, improve the relevance of recommendations, and provide an efficient connection between job seekers and recruiters. Future enhancements can include BERT-based semantic matching, AI-powered resume analysis, skill-gap analysis, explainable recommendations, fairness monitoring, chatbot assistance, and predictive job recommendations.

III. System Analysis

System analysis is an important stage in developing the Job Portal and Recommendation System. The system is designed to connect job seekers and recruiters through a centralized online platform. Job seekers can register and create

profiles containing their education, skills, experience, certifications, and job preferences. Recruiters can register and create job postings by specifying required skills, qualifications, experience, salary, and location. The system allows candidates to search and filter available jobs according to their requirements. Candidates can upload resumes and apply for suitable job positions through the platform. The recommendation module analyzes candidate profiles and job requirements to identify relevant opportunities. A matching score can be generated based on skills, qualifications, experience, and preferences. Candidates can receive personalized job recommendations through their dashboard. Recruiters can view applications, shortlist candidates, and manage recruitment activities. The system can maintain application history and provide notifications regarding application updates. Administrators can manage users, recruiters, job categories, job postings, and applications. Overall, system analysis defines the functional requirements needed to create an efficient and intelligent job-search platform.

Existing System

In the existing system, job seekers commonly use online job portals, newspapers, social-media platforms, and recruitment agencies to search for employment opportunities. Candidates often need to manually browse through a large number of job postings to identify suitable positions. Traditional job portals generally provide search and filtering facilities but may offer limited personalized recommendations. Candidates may have to repeatedly enter search criteria to find newly posted jobs that match their skills and preferences. Recruiters may also need to manually review numerous applications and resumes to identify suitable candidates. Basic keyword-based searches may fail to identify candidates whose skills are described using different terminology. Application tracking may be limited or require separate communication through email or telephone. Some systems provide recommendations based mainly on simple profile attributes rather than detailed skill and experience matching. Candidates may also receive many irrelevant job recommendations. Recruiters may face difficulties in efficiently comparing large numbers of applicants. These limitations increase the time required for both job searching and recruitment. Therefore, an intelligent recommendation system can improve the efficiency and relevance of the overall recruitment process.

Disadvantages of Existing System

- Requires considerable manual job searching.
- Large number of irrelevant job postings may be displayed.
- Limited personalized recommendations.
- Heavy dependence on keyword-based searching.
- May miss jobs with differently worded requirements.
- Manual resume screening can be time-consuming.
- Difficult to compare large numbers of candidates.
- Limited intelligent candidate-job matching.
- Application tracking may be inefficient.
- Candidates may miss newly posted relevant jobs.
- Limited skill-based recommendations.

- Recruiters may require additional tools for recruitment management.

Proposed System

The proposed Job Portal and Recommendation System provides a centralized platform for job seekers and recruiters to manage employment-related activities efficiently. Job seekers can register and create profiles containing their education, technical skills, experience, certifications, projects, and preferred job roles. They can upload resumes and search for available jobs using filters such as skills, location, experience, salary, and employment type. Recruiters can create job postings and specify the skills, qualifications, experience, and other requirements needed for each position. The recommendation module analyzes candidate information and compares it with available job requirements. A matching algorithm generates a suitability score based on relevant skills, qualifications, experience, and preferences. Suitable jobs can then be recommended to candidates according to their profiles. Recruiters can also view applications and identify potentially relevant candidates based on matching information. Candidates can apply for jobs and track their application status through their dashboard. The system can provide notifications for new recommendations, application updates, and recruitment activities. Administrators can manage users, recruiters, jobs, categories, and applications. Overall, the proposed system reduces manual searching and provides more relevant and personalized job recommendations.

Advantages of Proposed System

- Provides personalized job recommendations.
- Reduces manual job-search effort.
- Provides intelligent candidate-job matching.
- Generates job matching scores.
- Supports skill-based job searching.
- Helps candidates discover relevant opportunities.
- Reduces recruiter screening workload.
- Allows recruiters to manage job postings efficiently.
- Can be extended with AI and NLP technologies.

IV. Methodology

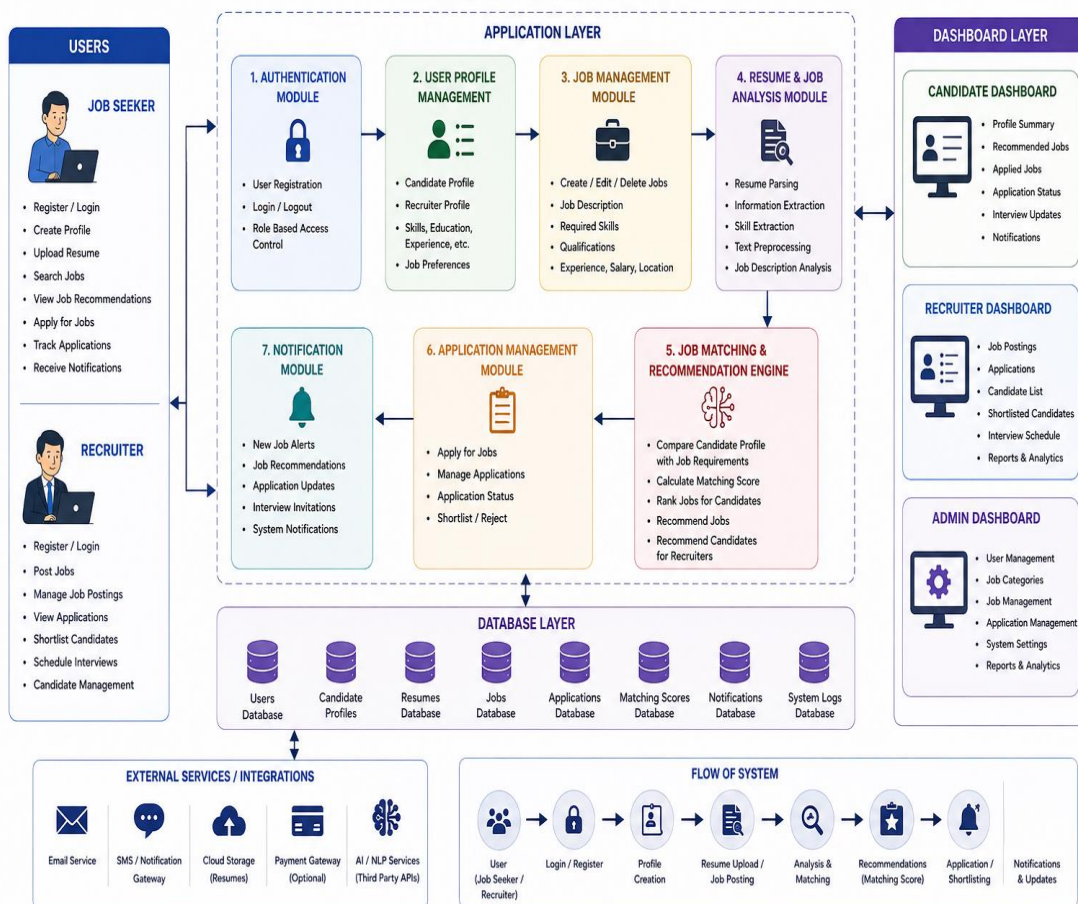
The methodology begins with identifying the requirements of job seekers, recruiters, and administrators. Job seekers register on the platform and create profiles containing education, skills, experience, certifications, projects, and job preferences. Recruiters create job postings by entering information such as job title, required skills, qualifications, experience, location, salary, and employment type. The system stores candidate profiles and job information in a centralized database. Resume information can be extracted and processed to identify important skills and qualifications. The recommendation module analyzes candidate profiles and job descriptions to determine their similarity. A matching algorithm calculates a score based on relevant skills, qualifications, experience, and preferences. Jobs with higher matching scores are recommended to suitable candidates. Candidates can review recommended jobs and submit applications through the platform. Recruiters can view applications,

compare candidates, and shortlist suitable applicants. The system records application activities and provides notifications regarding important updates. Administrators can manage users, jobs, categories, applications, and system settings. Finally, the system is tested for recommendation accuracy, search functionality, matching performance, database operations, security, responsiveness, and usability.

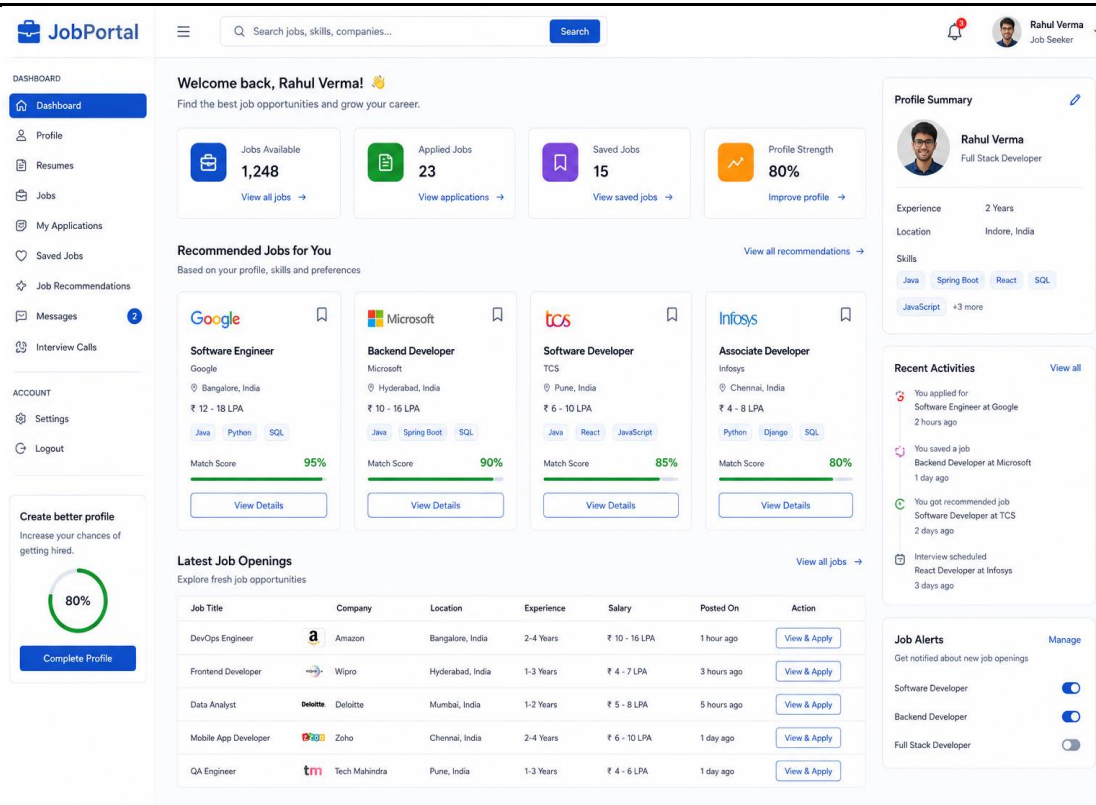
System Architecture

The system architecture represents the complete flow of information between job seekers, recruiters, recommendation modules, and the centralized database. The process begins when the job seeker or recruiter accesses the platform through a web-based interface. The authentication module verifies user credentials and provides access according to the user's role. Job seekers create profiles containing education, skills, experience, certifications, resumes, and job preferences. Recruiters create job postings containing job descriptions, required skills, qualifications, experience, salary, and location. The Resume and Job Analysis Module processes candidate resumes and job descriptions to extract relevant information. The extracted information is provided to the Job Matching and Recommendation Engine, which compares candidate profiles with job requirements. The recommendation engine generates matching scores and ranks suitable job opportunities for candidates. Candidates can view recommended jobs, apply for positions, and track their application status. Recruiters can view applications, identify suitable candidates, shortlist applicants, and manage recruitment activities. All user, job, recommendation, and application information is stored in the centralized database. The Notification Module provides alerts about new jobs, recommendations, application updates, and recruitment activities. The administrator dashboard allows authorized administrators to manage users, jobs, categories, applications, and system configurations. Overall, the architecture follows the workflow **User → Authentication → Candidate/Recruiter Profile → Resume & Job Analysis → Matching Engine → Recommendation & Matching Score → Job Search/Application → Database → Notifications → Recruiter/Admin Management & Analytics**.

JOB PORTAL AND RECOMMENDATION SYSTEM SYSTEM ARCHITECTURE



V. Result and Output



The screenshot displays a user dashboard for 'Rahul Verma', a Full Stack Developer. The interface includes a sidebar with navigation options like Dashboard, Profile, Resumes, Jobs, My Applications, Saved Jobs, Job Recommendations, Messages, Interview Calls, Account, Settings, and Logout. The main content area features a welcome message, statistics for available jobs (1,248), applied jobs (23), and saved jobs (15), along with a profile strength of 80%. It also shows recommended jobs from companies like Google, Microsoft, TCS, and Infosys, each with a match score and a 'View Details' button. A table of latest job openings is provided, listing positions such as DevOps Engineer, Frontend Developer, Data Analyst, Mobile App Developer, and QA Engineer, along with company names, locations, experience requirements, salaries, and posting dates. The right sidebar contains a profile summary, recent activities, and job alerts.

Job Title	Company	Location	Experience	Salary	Posted On	Action
DevOps Engineer	Amazon	Bangalore, India	2-4 Years	₹ 10 - 16 LPA	1 hour ago	View & Apply
Frontend Developer	Wipro	Hyderabad, India	1-3 Years	₹ 4 - 7 LPA	3 hours ago	View & Apply
Data Analyst	Deloitte	Mumbai, India	1-2 Years	₹ 5 - 8 LPA	5 hours ago	View & Apply
Mobile App Developer	Zoho	Chennai, India	2-4 Years	₹ 6 - 10 LPA	1 day ago	View & Apply
QA Engineer	Tech Mahindra	Pune, India	1-3 Years	₹ 4 - 6 LPA	1 day ago	View & Apply

VI. Conclusion

The Job Portal and Recommendation System provides an efficient and user-friendly platform for connecting job seekers with suitable employment opportunities. The system simplifies the traditional job-search process by allowing candidates to create profiles, upload resumes, search for jobs, apply for positions, and track their applications online.

The recommendation module improves the job-search experience by analyzing candidate skills, qualifications, experience, job preferences, and job requirements to identify relevant opportunities. Matching scores and personalized recommendations help candidates discover suitable jobs without manually searching through a large number of postings.

The system also benefits recruiters by providing facilities to post jobs, manage applications, view candidate information, shortlist applicants, and track recruitment activities. Centralized data management reduces manual effort and makes the recruitment process more organized.

Overall, the proposed system makes job searching faster, easier, personalized, and efficient while improving communication between candidates and recruiters. It reduces the time spent searching for relevant jobs and supports better job-matching decisions.

Future enhancements can include AI-based resume analysis, advanced semantic job matching, skill-gap analysis, personalized career recommendations, AI recruitment chatbots, interview preparation, predictive job recommendations, and automated candidate ranking.

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