

DRIVEN INTELLIGENT RECRUITMENT AND CANDIDATE MATCHING PLATFORM

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Abstract

The AI-Driven Intelligent Recruitment and Candidate Matching Platform is a smart web-based application designed to simplify and improve the recruitment process by using Artificial Intelligence (AI), Machine Learning (ML), and Natural Language Processing (NLP) techniques. Traditional recruitment methods often require recruiters to manually review a large number of resumes, compare candidate skills with job requirements, and shortlist suitable applicants. This process can be time-consuming, repetitive, and prone to human bias and errors.

The proposed platform provides a centralized system where recruiters can create job postings, define required skills, manage applications, and identify suitable candidates. Candidates can create profiles, upload resumes, enter their educational qualifications, technical skills, experience, and preferred job roles. The system analyzes candidate profiles and job descriptions to identify similarities between required and available skills.

An intelligent candidate matching module calculates a matching score based on factors such as skills, qualifications, work experience, job preferences, and other relevant criteria. The system can rank candidates according to their suitability for a particular job, helping recruiters focus on the most relevant applicants. NLP techniques can be used to extract important information from resumes and job descriptions automatically.

I. Introduction

The AI-Driven Intelligent Recruitment and Candidate Matching Platform is a web-based application designed to make the recruitment process faster, smarter, and more efficient. In traditional recruitment, recruiters often receive a large number of resumes for a single job position and have to manually review each resume to identify suitable candidates. This process requires significant time and effort and may result in overlooking qualified candidates.

The proposed system uses Artificial Intelligence (AI), Machine Learning (ML), and Natural Language Processing (NLP) to automate important recruitment activities. Candidates can create profiles and provide information such as education, technical skills, certifications, work experience, projects, and preferred job roles. They can also upload their resumes for automated analysis.

Recruiters can create job postings by specifying requirements such as required skills, educational qualifications, experience, job location, and other criteria. The system analyzes the job description and candidate profiles to identify similarities between candidate qualifications and job requirements.

An intelligent candidate matching module calculates a matching score based on relevant factors such as skills, qualifications, experience, and job preferences. Candidates can then be ranked according to their suitability for a particular job. This helps recruiters quickly identify potentially suitable candidates instead of manually reviewing every application.

II. Literature Survey

The AI-Driven Intelligent Recruitment and Candidate Matching Platform is based on research and developments in artificial intelligence, machine learning, natural language processing, resume screening, and intelligent job recommendation systems. Traditional recruitment processes generally depend on recruiters manually reviewing resumes and comparing candidate qualifications with job requirements. As the number of applications increases, this process becomes time-consuming and difficult to manage efficiently.

Early Applicant Tracking Systems (ATS) were developed to organize recruitment information and manage job applications digitally. These systems allow recruiters to store resumes, track applications, and manage candidate information. However, many traditional ATS solutions primarily focus on record management and keyword-based filtering rather than intelligent understanding of candidate skills and job requirements.

Research in automated resume screening has explored techniques for extracting important information from resumes. Natural Language Processing can be used to identify entities such as education, technical skills, certifications, work experience, job titles, and projects. Extracting these details automatically can reduce the amount of manual work required during the initial recruitment stage.

Natural Language Processing (NLP) has also been applied to analyze job descriptions. NLP techniques can identify important skills, qualifications, experience requirements, and other relevant terms from job postings. By converting both resumes and job descriptions into structured information, recruitment systems can compare candidates with job requirements more effectively.

Machine-learning techniques have been investigated for candidate-job matching and ranking. Algorithms can calculate similarity between candidate profiles and job descriptions using factors such as skills, qualifications, experience, and job preferences. Candidates can then be ranked according to their calculated suitability scores, allowing recruiters to focus on potentially relevant applicants.

Research has also explored semantic matching rather than relying only on exact keyword matches. For example, a candidate's resume may use terminology that differs from the wording used in a job description while still representing a related skill. NLP

and semantic-similarity techniques can help identify these relationships and improve the quality of candidate matching.

Another important area is personalized job recommendation. Recommendation systems can analyze a candidate's skills, education, experience, previous applications, and preferred job roles to suggest potentially relevant vacancies. This approach can improve the candidate experience by reducing the effort required to search through large numbers of job postings.

Modern recruitment platforms increasingly provide recruiter dashboards and recruitment analytics. These systems can display application statistics, candidate rankings, recruitment progress, and hiring trends. Such analytics can help recruiters organize their workflow and make more informed decisions during the recruitment process.

Researchers have also investigated AI-assisted interview and candidate evaluation systems. AI can potentially support interview scheduling, question generation, response analysis, and skill assessment. However, automated evaluation requires careful design because candidate performance can be affected by factors such as language, communication style, recording quality, and context.

Fairness, transparency, and bias are important considerations in AI-based recruitment. Historical recruitment data may contain biases that can be reproduced by machine-learning models. Therefore, intelligent recruitment systems should use appropriate datasets, monitor model performance across relevant groups, provide explainable recommendations where possible, and keep human recruiters involved in important hiring decisions.

Despite significant developments, existing recruitment systems can still have limitations such as keyword dependency, inaccurate resume extraction, limited semantic understanding, insufficient personalization, biased recommendations, and lack of explainability. These challenges demonstrate the need for recruitment platforms that combine automated information extraction, intelligent matching, candidate recommendations, and transparent decision-support features.

Based on these research areas, the proposed AI-Driven Intelligent Recruitment and Candidate Matching Platform combines resume analysis, job-description analysis, NLP-based information extraction, candidate-job matching, ranking, personalized job recommendations, application management, and recruitment analytics within a centralized platform. The system aims to reduce manual screening effort while helping recruiters identify potentially suitable candidates more efficiently. Future enhancements can include AI-powered interview evaluation, skill-gap analysis, predictive recruitment analytics, recruitment chatbots, explainable AI, bias monitoring, automated interview scheduling, and personalized career recommendations.

III. System Analysis

System analysis is an important stage in developing the AI-Driven Intelligent Recruitment and Candidate Matching Platform. The system is designed to simplify recruitment by connecting candidates and recruiters through a centralized platform. Candidates can register and create profiles containing their education, skills, certifications, experience, projects, and preferred job roles. Recruiters can create job postings by specifying required skills, qualifications, experience, location, and other job requirements. The system can analyze uploaded resumes and extract important candidate information using Natural Language Processing techniques. Job descriptions can also be analyzed to identify important skills and qualifications. The candidate matching module compares candidate profiles with job requirements and calculates a matching score. Suitable candidates can be ranked according to their skills, qualifications, and experience. Candidates can receive job recommendations based on their profiles and preferences. Recruiters can manage applications, shortlist candidates, schedule interviews, and track recruitment progress. An administrator can manage users, job postings, applications, and system configurations. Overall, the system analysis defines the functional requirements needed to build an intelligent and efficient recruitment platform.

Existing System

In the existing recruitment system, organizations commonly depend on manual resume screening, traditional job portals, and basic Applicant Tracking Systems. Recruiters may receive hundreds or thousands of applications for a single job position and manually examine resumes to identify suitable candidates. This process can consume significant time and effort, particularly for large-scale recruitment. Traditional systems often depend on keyword-based filtering, which may fail to understand the actual meaning of skills and qualifications. Candidates using different terminology for similar skills may therefore be overlooked. Job seekers also need to manually search through numerous job postings to find suitable opportunities. Existing platforms may provide limited personalized job recommendations based on a candidate's complete profile. Recruiters may also have limited tools for comparing candidates based on multiple recruitment criteria. Manual evaluation can introduce inconsistency and human bias into the screening process. Application tracking and interview scheduling may require separate tools or manual communication. Therefore, an intelligent platform is required to automate candidate matching and improve recruitment efficiency.

Disadvantages of Existing System

- Requires significant manual resume screening.
- Time-consuming when applications are large in number.
- Heavy dependence on keyword-based filtering.
- May overlook candidates with relevant but differently worded skills.
- Limited intelligent candidate-job matching.
- Limited personalized job recommendations.
- Difficult to compare large numbers of candidates efficiently.
- Manual screening may introduce inconsistency or bias.

- Limited automated resume information extraction.
- Interview scheduling may require separate processes.
- Limited recruitment analytics and insights.
- Higher workload for recruiters.

Proposed System

The proposed AI-Driven Intelligent Recruitment and Candidate Matching Platform provides an automated and intelligent approach to modern recruitment. Candidates can create profiles containing their educational qualifications, technical skills, certifications, projects, work experience, and job preferences. They can also upload resumes, which are analyzed automatically to extract relevant information. Recruiters can create job postings by entering required skills, qualifications, experience, location, and other criteria. The system uses NLP techniques to analyze job descriptions and identify important requirements. The candidate matching module compares extracted candidate information with job requirements and generates a suitability or matching score. Candidates can be ranked according to their relevance to a particular job position. The system can also recommend suitable job opportunities to candidates based on their skills and preferences. Recruiters can view candidate profiles, matching scores, applications, and shortlist suitable candidates through a dashboard. The platform can support application tracking, interview scheduling, notifications, and recruitment analytics. Administrators can manage users, job postings, applications, and system configurations. Overall, the proposed system reduces manual screening effort and supports faster, more organized, and data-driven recruitment.

Advantages of Proposed System

- Automates initial resume screening.
- Provides intelligent candidate-job matching.
- Uses NLP for resume and job-description analysis.
- Generates candidate matching scores.
- Helps rank potentially suitable candidates.
- Provides personalized job recommendations.
- Reduces recruiter workload and screening time.
- Supports centralized application management.
- Helps recruiters compare candidates efficiently.
- Provides recruitment analytics and reports.
- Supports interview scheduling and notifications.
- Can be extended with AI-powered recruitment features.

IV. Methodology

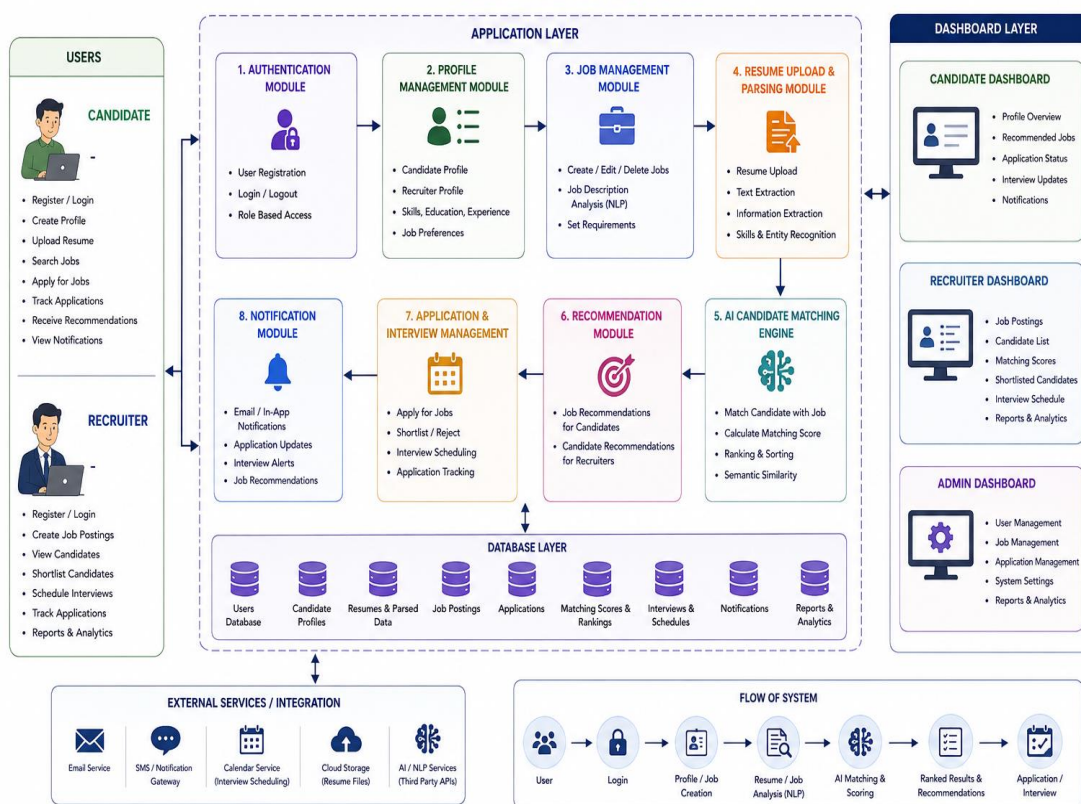
The methodology begins with collecting and organizing candidate profiles, resumes, and job descriptions required for the recruitment process. Candidates register on the platform and provide information such as education, skills, certifications, experience, projects, and preferred job roles. Recruiters create job postings by specifying required skills, qualifications, experience, location, and other relevant requirements. The system preprocesses uploaded resumes and job descriptions by removing unnecessary

information and extracting meaningful text. NLP techniques are then used to identify important entities such as skills, qualifications, job titles, and experience. The extracted information is converted into structured candidate and job profiles. A matching algorithm compares candidate attributes with job requirements and calculates a suitability score. Candidates are ranked based on their matching scores and relevant recruitment criteria. The recommendation module suggests suitable job opportunities to candidates based on their profiles and preferences. Recruiters can review recommended candidates, manage applications, shortlist applicants, and schedule interviews. The system stores recruitment activities in a centralized database for tracking and analytics. Finally, the platform is tested for resume extraction, matching accuracy, recommendation quality, security, performance, and usability.

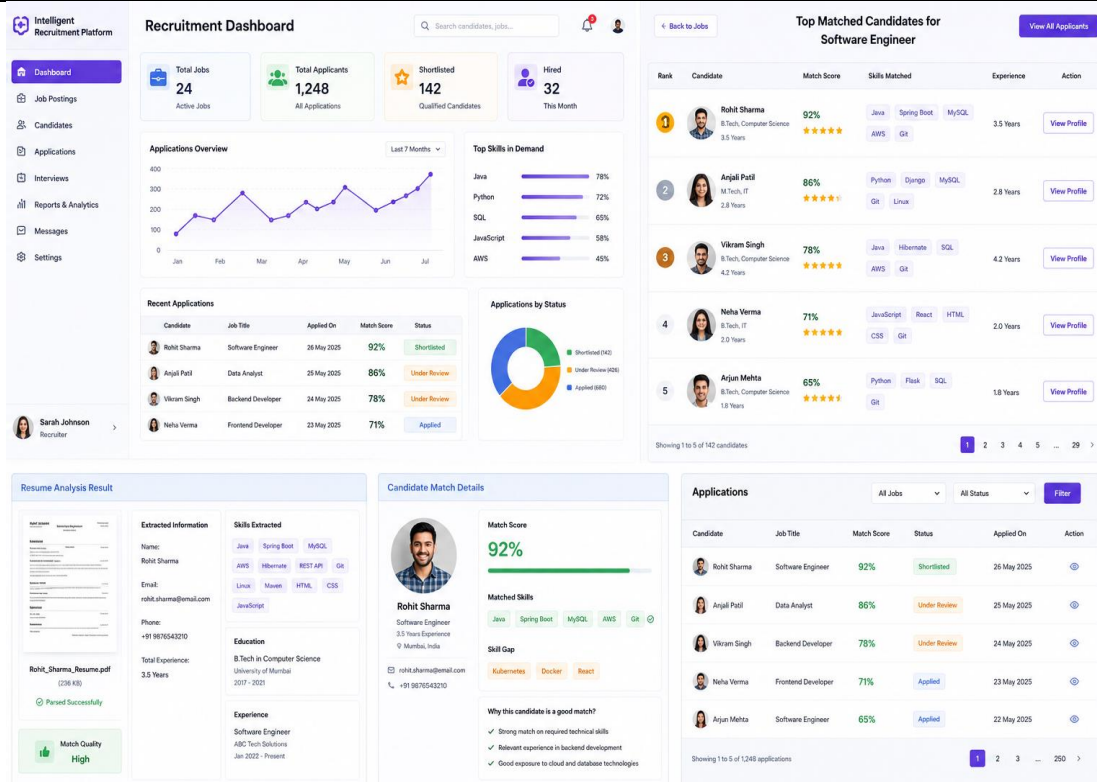
System Architecture

The system architecture represents the complete flow of information between candidates, recruiters, AI modules, and the centralized database. The process begins with the Candidate or Recruiter accessing the platform through a web-based interface. The authentication module verifies user credentials and provides access according to the user's role. Candidates create profiles, upload resumes, and provide their education, skills, experience, and job preferences through the candidate management module. Recruiters create job postings containing required skills, qualifications, experience, and other job requirements. The NLP and Resume Analysis Module extracts meaningful information from candidate resumes and job descriptions. The extracted information is passed to the AI Candidate Matching Engine, which compares candidate profiles with job requirements. The matching engine calculates suitability scores and ranks candidates according to their relevance. The Recommendation Module provides suitable job recommendations to candidates and potentially relevant candidate recommendations to recruiters. Application, shortlist, and interview information is stored in the centralized database. The recruiter dashboard provides candidate comparison, application tracking, interview scheduling, and recruitment analytics. The administrator dashboard allows authorized administrators to manage users, jobs, applications, and system configurations. Overall, the architecture follows the workflow **User → Authentication → Candidate/Recruiter Profile → Resume & Job Analysis → NLP Processing → AI Matching Engine → Matching Score & Ranking → Recommendations → Application Management → Database → Analytics & Admin Management**.

AI-DRIVEN INTELLIGENT RECRUITMENT AND CANDIDATE MATCHING PLATFORM
— SYSTEM ARCHITECTURE —



V. Result and Output



VI. Conclusion

The AI-Driven Intelligent Recruitment and Candidate Matching Platform provides an efficient and intelligent solution for modern recruitment processes. The system reduces the time and effort required for manual resume screening by automatically analyzing candidate profiles and job descriptions.

The platform uses Artificial Intelligence, Machine Learning, and Natural Language Processing to extract relevant information such as skills, qualifications, experience, and job requirements. The candidate matching module compares these factors and generates a matching score, helping recruiters identify potentially suitable candidates more efficiently.

The system also provides candidate ranking, personalized job recommendations, resume analysis, application tracking, interview scheduling, notifications, and recruitment analytics. These features improve communication between candidates and recruiters and provide a centralized environment for managing the complete recruitment process.

Overall, the proposed system makes recruitment faster, organized, scalable, and data-driven while reducing repetitive manual work. It can help recruiters make better-informed decisions and help candidates discover job opportunities that align with their skills and career preferences.

Future enhancements can include AI-powered interview evaluation, skill-gap analysis, predictive hiring analytics, resume-based interview generation, recruitment chatbots, explainable AI, bias monitoring, automated interview scheduling, and personalized career development recommendations.

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