iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** VI **Month of publication:** June 2026

DOI: https://doi.org/10.22214/ijraset.2026.83575

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue VI June 2026- Available at www.ijraset.com

AI Resume Scanner and Candidate Ranker: An Intelligent Framework for Automated Recruitment Screening

Rajeshwari N, Nischitha M, Deeksha M R, Deeksha R, Devika P C
MMK & SDM Mahila Maha VIdyalaya, Mysuru

Abstract: ***The rapid growth of online recruitment platforms has significantly increased the volume of job applications received by organizations. Manual resume screening has become a time-consuming, repetitive, and error-prone task that often delays the recruitment process and affects hiring efficiency. To address these challenges, this paper presents an AI Resume Scanner and Candidate Ranker, an intelligent recruitment support framework designed to automate resume analysis and candidate shortlisting. The proposed system utilizes Natural Language Processing (NLP) techniques and a weighted scoring mechanism to extract candidate information from resumes and compare it against predefined job requirements. The framework evaluates candidates based on multiple criteria, including technical skills, educational qualifications, work experience, and keyword relevance. The system is implemented using React.js, Node.js, Express.js, and MySQL, providing an integrated platform for resume upload, candidate ranking, dashboard visualization, and report generation. Experimental evaluation demonstrates that the proposed approach significantly reduces recruiter workload while improving transparency and consistency in candidate selection. The framework serves as a practical decision-support tool that assists recruiters in identifying qualified candidates efficiently while maintaining human oversight during final hiring decisions.***

Keyword- Artificial Intelligence, Resume Screening, Candidate Ranking, Recruitment Automation, Natural Language Processing, Human Resource Management, Applicant Tracking System

I. INTRODUCTION

Recruitment is one of the most critical processes in human resource management. Organizations frequently receive hundreds or even thousands of applications for a single job opening, making manual screening increasingly difficult. Traditional resume evaluation methods require recruiters to examine candidate qualifications individually, resulting in considerable time consumption and inconsistencies in decision-making.

Recent advancements in Artificial Intelligence (AI) and Natural Language Processing (NLP) have enabled automation in several recruitment activities. Automated Applicant Tracking Systems (ATS) can analyze resumes, identify relevant skills, and generate candidate rankings based on predefined job requirements. However, many existing systems rely heavily on keyword matching techniques and provide limited transparency regarding ranking decisions.

The proposed AI Resume Scanner and Candidate Ranker addresses these limitations by introducing an explainable candidate ranking framework. The system automatically extracts candidate information from uploaded resumes, evaluates multiple recruitment criteria, and generates ranking scores that can be reviewed by recruiters. The objective is not to replace human decision-making but to enhance recruitment efficiency through intelligent automation.

II. OBJECTIVES

1) Automate resume parsing and candidate information extraction.
2) Compare candidate profiles with job requirements.
3) Generate transparent ranking scores using multiple evaluation criteria.
4) Reduce manual effort involved in candidate screening.
5) Improve recruitment efficiency and consistency.
6) Support scalable and secure recruitment operations.

©IJRASET: All Rights are Reserved

III. LITERATURE REVIEW

Recruitment automation has gained significant attention in both academia and industry. Traditional Applicant Tracking Systems primarily utilize keyword-based matching algorithms to identify candidate suitability. While these systems improve processing speed, they often fail to capture contextual relationships between skills and job requirements.

Saatci et al. proposed NLP-based resume screening methods capable of extracting candidate attributes and improving matching accuracy. Similarly, Chen investigated ethical concerns associated with AI-enabled recruitment systems and emphasized the importance of transparency and fairness in candidate evaluation.

Modern recruitment solutions increasingly employ machine learning and transformer-based language models to enhance candidate matching. Although these approaches improve prediction accuracy, they often operate as black-box systems, limiting recruiter trust and explainability.

Several studies have highlighted the need for transparent AI frameworks that provide understandable ranking criteria while maintaining recruitment efficiency. Consequently, there is growing demand for lightweight, explainable, and scalable recruitment support systems that can be deployed within educational institutions, startups, and medium-sized enterprises.

IV. RESEARCH GAP

Analysis of existing recruitment systems reveals several limitations.

Existing Challenge	Limitation	Proposed Solution
Manual Screening	Time-consuming and inconsistent	Automated ranking framework
Keyword Matching	Limited contextual understanding	Multi-criteria evaluation
Black-Box AI Models	Lack of explainability	Transparent weighted scoring
Recruitment Dashboards	Limited usability	Interactive visualization
Data Security	Exposure of personal information	Secure role-based access

Most available systems either focus exclusively on automation or prioritize prediction accuracy without providing interpretable results. Furthermore, many commercial solutions require significant infrastructure and licensing costs. The proposed framework aims to bridge these gaps by combining automation, transparency, affordability, and scalability.

V. PROPOSED METHODOLOGY

The proposed AI Resume Scanner and Candidate Ranker framework automates the recruitment process by extracting candidate information from resumes, analyzing job requirements, and generating candidate rankings using a weighted scoring mechanism. The framework consists of six major phases: Job Creation, Resume Upload, Resume Parsing, Information Extraction, Candidate Evaluation, and Candidate Ranking.

The proposed methodology consists of 4 major phases:

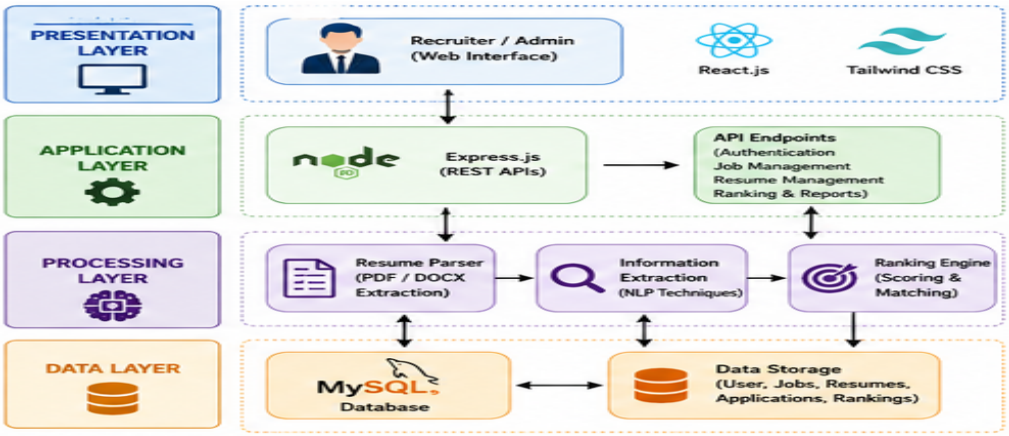


Fig 1: Proposed System Architecture

The proposed architecture consists of four layers: Presentation Layer, Application Layer, Processing Layer, and Data Layer. The Presentation Layer provides an interactive interface for recruiters using React.js and Tailwind CSS. The Application Layer handles business logic and API communication through Node.js and Express.js. The Processing Layer performs resume parsing, information extraction, and candidate ranking operations. The Data Layer stores job descriptions, candidate information, ranking results, and application records using MySQL. The layered architecture ensures modularity, scalability, and maintainability.

A. System Workflow

The recruiter creates a job profile containing required skills, preferred skills, educational requirements, and experience expectations. Candidate resumes are uploaded in PDF or DOCX format and processed through the parsing engine.



Fig 2: System Workflow Architecture

The workflow begins when the recruiter creates a job description specifying required skills, educational qualifications, and experience criteria. Candidates upload resumes in PDF or DOCX format. The resume parser extracts relevant information such as skills, education, certifications, and work experience. The extracted attributes are matched against job requirements, and suitability scores are generated. Based on these scores, the ranking engine produces an ordered list of candidates and generates recruitment reports for decision-making.

B. Candidate Ranking Algorithm

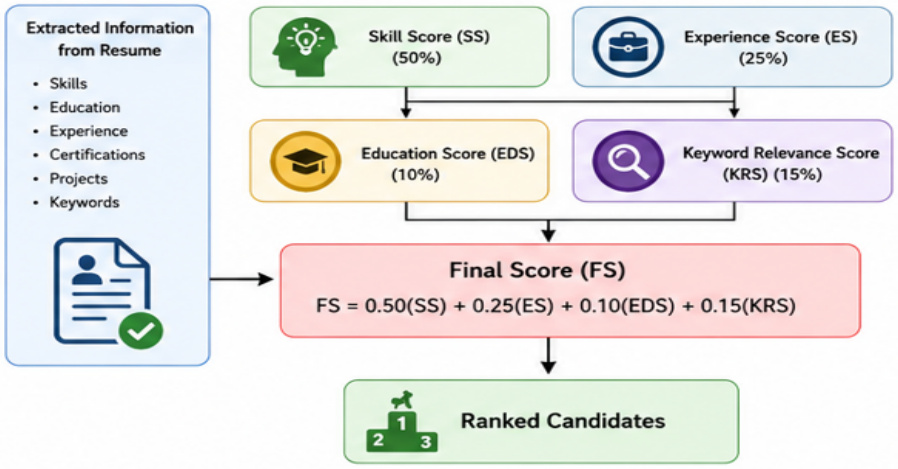


Fig 3: Candidate Ranking Model

The candidate ranking module evaluates applicants using multiple recruitment criteria. Four major scoring components are considered:

- Skill Score (SS)
- Experience Score (ES)
- Education Score (EDS)
- Keyword Relevance Score (KRS)

The final ranking score is computed using the weighted formula:

FS=0.50(SS)+0.25(ES)+0.10(EDS)+0.15(KRS)FS = 0.50(SS) + 0.25(ES) + 0.10(EDS) + 0.15(KRS)FS=0.50(SS)+0.25(ES)+0.10(EDS)+0.15(KRS)

where:

- FS = Final Score
- SS = Skill Matching Score
- ES = Experience Score
- EDS = Education Score
- KRS = Keyword Relevance Score

Candidates are ranked in descending order based on the final score, enabling recruiters to identify the most suitable applicants efficiently.

D. Algorithm Steps

Algorithm 1: Candidate Ranking Process

Input: Job Description (J), Resume Set (R)

Output: Ranked Candidate List

- Upload candidate resumes.
- Extract resume text content.
- Parse candidate skills, education, and experience.
- Compare extracted attributes with job requirements.
- Calculate individual evaluation scores.
- Compute the final weighted score.
- Sort candidates based on final score.
- Generate ranking results.
- Export shortlisted candidate reports.

VI. EXPERIMENTAL SETUP

A. Development Environment

Component	Technology
Front-End	React.js
Back-End	Node.js, Express.js
Database	MySQL
Styling	Tailwind CSS
Runtime	Node.js Runtime Environment

B. Test Dataset

The experimental dataset consists of multiple candidate resumes and job descriptions representing software development and data analytics positions.

C. Evaluation Criteria

The effectiveness of the proposed system was evaluated using the following criteria:

- Resume Parsing Efficiency

- Candidate Ranking Accuracy
- Processing Time
- System Scalability
- User Satisfaction
- Report Generation Capability

D. Functional Testing Results

Test Case	Expected Result	Status
User Login	Successful authentication	Pass
Resume Upload	Resume stored successfully	Pass
Resume Parsing	Candidate details extracted	Pass
Candidate Ranking	Rank generated correctly	Pass
Report Export	PDF/Excel generated	Pass

E. Performance Analysis

Parameter	Observation
Average Resume Upload Time	Less than 2 seconds
Resume Parsing Time	1–3 seconds per resume
Candidate Ranking Time	Less than 1 second
Report Generation Time	Less than 2 seconds
Concurrent User Support	Multiple users supported

VII. RESULTS AND DISCUSSION

A. Functional Evaluation

Module	Status
Authentication	Passed
Job Creation	Passed
Resume Upload	Passed
Resume Parsing	Passed
Candidate Ranking	Passed
Dashboard Visualization	Passed
Report Export	Passed

B. Comparative Analysis

Method	Screening Speed	Transparency	Scalability
Manual Screening	Low	High	Low
Traditional ATS	Medium	Medium	Medium
Proposed Framework	High	High	High

The proposed framework significantly reduces candidate evaluation time while maintaining transparency.

C. Performance Comparison

Feature	Manual Screening	Traditional ATS	Proposed Framework
Resume Processing	Manual	Semi-Automated	Automated
Candidate Ranking	Manual	Keyword-Based	Weighted Scoring
Processing Speed	Low	Medium	High
Transparency	High	Medium	High
Scalability	Low	Medium	High

The proposed framework demonstrated improved efficiency and transparency compared with traditional recruitment approaches. Automated resume parsing and ranking reduced recruiter workload while maintaining decision-making control.

D. Discussion

Experimental results indicate that the proposed framework successfully automates resume screening while preserving recruiter control. The weighted scoring mechanism improves explainability and enables recruiters to understand ranking decisions. The dashboard provides comprehensive candidate insights, enhancing recruitment transparency.

VIII. CONCLUSION AND FUTURE WORK

This paper presented an AI Resume Scanner and Candidate Ranker for automated recruitment screening. The proposed framework combines resume parsing, candidate evaluation, and transparent ranking mechanisms to improve recruitment efficiency. By integrating NLP-inspired processing techniques with weighted scoring algorithms, the system reduces manual workload and accelerates candidate shortlisting.

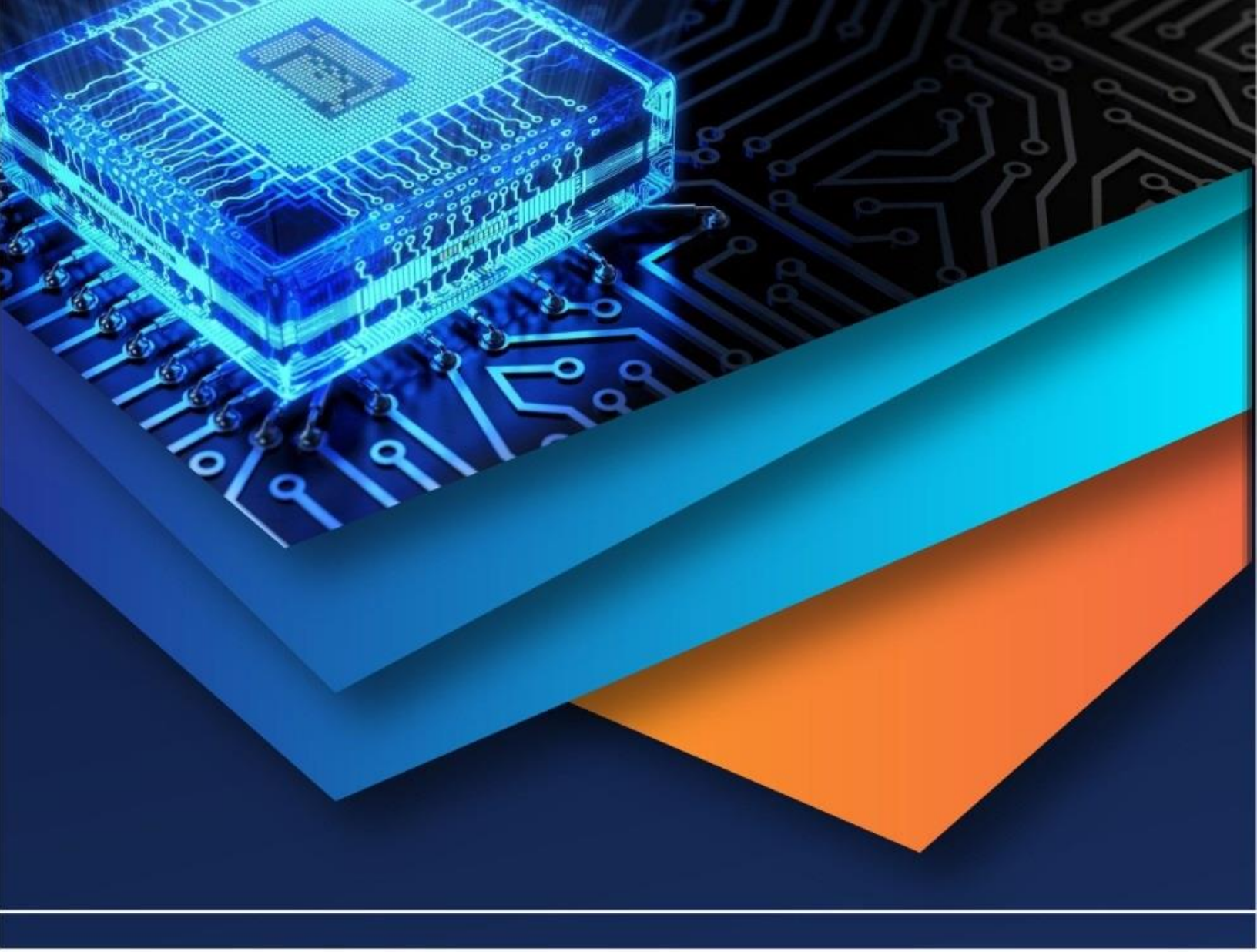
The implementation demonstrates that intelligent automation can significantly improve recruitment workflows while maintaining transparency and fairness. The framework serves as a practical decision-support system rather than a replacement for human recruiters.

Future research will focus on incorporating transformer-based semantic matching, OCR support for scanned resumes, multilingual candidate processing, fairness evaluation, recruiter feedback learning, interview scheduling integration, and advanced analytics dashboards.

REFERENCES

[1] MDN Web Docs, “HTML: HyperText Markup Language,” Available: https://developer.mozilla.org
[2] MDN Web Docs, “CSS Reference,” Available: https://developer.mozilla.org
[3] MDN Web Docs, “JavaScript Guide,” Available: https://developer.mozilla.org
[4] React Documentation, “React: The Library for Web and Native User Interfaces,” Available: https://react.dev
[5] Node.js Documentation, “Node.js Runtime Environment,” Available: https://nodejs.org
[6] Oracle Corporation, “MySQL Reference Manual,” Available: https://dev.mysql.com
[7] Tailwind Labs, “Tailwind CSS Documentation,” Available: https://tailwindcss.com
[8] M. Saatci, R. Kaya, and R. Unlu, “Resume Screening with Natural Language Processing,” 2024.
[9] Z. Chen, “Ethics and Discrimination in Artificial Intelligence-Enabled Recruitment Practices,” Humanities and Social Sciences Communications, vol. 10, no. 1, pp. 1–12, 2023.
[10] “Automated Resume Screening System Using NLP and Keyword Matching,” International Journal of Engineering Research and Technology (IJERT), 2026.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)