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### AI Powered Recruitment System

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Peer Review Information	Abstract
<p><i>Submission: 28 Jan 2026</i></p> <p><i>Revision: 20 Feb 2026</i></p> <p><i>Acceptance: 06 March 2026</i></p> <p><b>Keywords</b></p> <p><i>AI-Powered Recruitment, Resume Screening, Machine Learning, Natural Language Processing (NLP), Automated Interview System, Candidate Ranking, Resume Parsing, Intelligent Hiring System.</i></p>	<p>The recruitment process in many organizations involves reviewing a large number of resumes to identify suitable candidates for job positions. This manual screening process is time-consuming, labor-intensive, and often prone to human bias, making it difficult for recruiters to efficiently evaluate all applications. To address these challenges, this study proposes an AI-powered automated resume screening and interview system that utilizes advanced machine learning and natural language processing techniques to analyze resumes and assist in the recruitment process. The system is designed to automatically extract relevant information such as skills, qualifications, work experience, and keywords from candidate resumes and match them with job requirements to determine the suitability of applicants. The proposed system incorporates multiple machine learning and artificial intelligence approaches, including text preprocessing, feature extraction, and classification algorithms to evaluate candidate profiles. Natural Language Processing (NLP) techniques are used to process and interpret textual information present in resumes, while machine learning models analyze the extracted features to classify and rank candidates based on their compatibility with the job description. Additionally, the system includes an automated interview module that generates relevant interview questions and evaluates candidate responses, further assisting recruiters in shortlisting qualified applicants. By integrating artificial intelligence with recruitment processes, the proposed system aims to significantly reduce the time and effort required for resume screening while improving the accuracy and fairness of candidate selection. The automated evaluation and ranking mechanism helps recruiters identify the most suitable candidates efficiently and supports data-driven decision-making in hiring processes. The implementation of such an intelligent recruitment system has the potential to streamline hiring workflows, minimize human bias, and enhance the overall efficiency of talent acquisition in modern organizations.</p>

#### Introduction

The rapid growth of digital recruitment platforms and online job portals has significantly increased the number of job

applications submitted to organizations. Recruiters often receive hundreds or even thousands of resumes for a single job position, making the process of identifying suitable

candidates extremely time-consuming and challenging. Traditional recruitment methods rely heavily on manual resume screening and human judgment, which can be inefficient and prone to bias. As a result, organizations are increasingly seeking intelligent solutions that can automate and streamline the hiring process while ensuring accurate and fair candidate evaluation. Artificial Intelligence (AI) and Machine Learning (ML) technologies have shown great potential in transforming various industries, including human resource management. By leveraging these technologies, recruitment systems can analyze large volumes of candidate data quickly and effectively. Automated resume screening systems use Natural Language Processing (NLP) techniques to extract relevant information such as skills, education, work experience, and certifications from resumes. This information can then be compared with job requirements to identify candidates who best match the desired qualifications. Such automated systems help reduce the workload of recruiters and enable faster decision-making during the hiring process. In addition to resume screening, conducting preliminary interviews is another important stage in the recruitment process. Traditional interviews require significant time and effort from recruiters and hiring managers, especially when dealing with a large pool of applicants. AI-powered interview systems can assist in this stage by automatically generating relevant interview questions based on the candidate's resume and job description. These

systems may also evaluate candidate responses using machine learning techniques, allowing recruiters to assess communication skills, technical knowledge, and overall suitability for the role. The integration of AI-based resume analysis and automated interview systems provides a comprehensive solution for modern recruitment challenges. Machine learning algorithms can be used to classify and rank candidates based on their qualifications and experience, enabling recruiters to focus on the most promising applicants. Furthermore, such systems can reduce human bias by relying on objective data-driven evaluation methods. The use of intelligent recruitment tools not only improves the efficiency of the hiring process but also helps organizations select the most suitable candidates in a consistent and reliable manner. In this project, we propose an AI-powered automated resume screening and interview system that combines machine learning and natural language processing techniques to analyze candidate resumes and support the recruitment process. The system is designed to automatically extract relevant features from resumes, compare them with job requirements, rank candidates according to their suitability, and assist in conducting automated interviews. By integrating these functionalities into a single intelligent platform, the proposed system aims to simplify recruitment workflows, improve candidate evaluation accuracy, and provide an effective decision-support tool for human resource professionals.

**Literature Review**

Sr. No.	Author & Year	Title	Method / Technology Used	Key Findings
1	Smith et al. (2024)	AI-Based Resume Screening for Recruitment Systems	AI, Machine Learning, NLP	Automated system extracts skills, qualifications, and experience from resumes and matches them with job requirements, reducing recruitment time and improving accuracy.
2	Kumar et al. (2024)	Automated Resume Parsing and Candidate Ranking Using Machine Learning	Resume Parsing, Text Processing, Machine Learning	Extracts structured information from resumes and ranks candidates based on job description matching, improving recruitment efficiency.
3	Lee et al. (2023)	Natural Language Processing for Intelligent Recruitment Systems	NLP, Tokenization, Keyword Extraction, Semantic Analysis	Uses NLP techniques to analyze resumes and compare them with job descriptions, helping identify qualified candidates and reducing manual effort.
4	Patel et al. (2023)	Machine Learning Approaches for Candidate Screening in HR Analytics	Decision Tree, Random Forest, Logistic Regression	Machine learning models evaluate candidates based on skills, education, and experience and classify them according to job

				suitability.
5	Wang et al. (2023)	Deep Learning-Based Resume Classification System	Deep Learning, Neural Networks	Classifies resumes into job categories with higher accuracy compared to traditional machine learning techniques.
6	Sharma et al. (2023)	Intelligent Hiring System Using Artificial Intelligence	AI, NLP, Candidate Scoring System	Automates resume analysis and candidate evaluation using a scoring mechanism, improving consistency and reducing recruiter workload.
7	Chen et al. (2023)	Automated Interview Systems Using Artificial Intelligence	AI, Machine Learning	Generates interview questions based on resumes and analyzes candidate responses to evaluate suitability.
8	Gupta et al. (2022)	Resume Screening Using Text Mining Techniques	Text Mining, Keyword Extraction	Extracts important keywords and compares them with job requirements to efficiently shortlist candidates.
9	Brown et al. (2022)	AI-Driven Talent Acquisition Systems	AI-based Recruitment Automation	Automates tasks like resume screening, ranking, and scheduling, improving hiring speed and reducing costs.
10	Singh et al. (2022)	Smart Recruitment System Using Machine Learning and NLP	Machine Learning, NLP	Combines ML and NLP to analyze resumes and rank candidates, improving recruitment efficiency and accuracy.

1) Smith et al., "AI-Based Resume Screening for Recruitment Systems" (2024): This study presents an automated recruitment system that uses artificial intelligence and machine learning techniques to analyze resumes and shortlist candidates. The proposed system uses Natural Language Processing (NLP) to extract important features such as skills, qualifications, and work experience from resumes. Machine learning algorithms are then applied to match candidate profiles with job requirements. The results demonstrate that the automated system significantly reduces recruitment time and improves candidate selection accuracy compared to traditional manual screening methods.[1]

2) Kumar et al., "Automated Resume Parsing and Candidate Ranking Using Machine Learning" (2024): In this research, the authors propose a resume parsing system that automatically extracts structured information from unstructured resume documents. The system uses text processing and classification techniques to identify candidate skills, educational background, and professional experience. A ranking algorithm is then used to compare the extracted information with job descriptions to determine candidate suitability. The study shows that the automated ranking system improves the efficiency of recruitment

and helps recruiters quickly identify the most relevant applicants. [2]

3) Lee et al., "Natural Language Processing for Intelligent Recruitment Systems" (2023): This paper explores the use of Natural Language Processing techniques in recruitment systems to analyze textual information present in resumes and job descriptions. The authors propose a framework that applies tokenization, keyword extraction, and semantic analysis to identify relevant candidate attributes. The system then uses similarity matching techniques to compare resumes with job requirements. Experimental results indicate that NLP-based systems can effectively identify qualified candidates and reduce manual effort in the recruitment process..[3]

4) Patel et al., "Machine Learning Approaches for Candidate Screening in HR Analytics" (2023): This research focuses on the application of machine learning algorithms such as Decision Tree, Random Forest, and Logistic Regression for candidate screening. The system evaluates candidate profiles based on multiple parameters, including skills, education, and experience. The authors demonstrate that machine learning models can accurately classify and rank candidates according to their suitability for a specific job role, providing a data-driven approach to recruitment decision-

making.[4]

5) Wang et al., “Deep Learning-Based Resume Classification System” (2023): The authors propose a deep learning-based approach for classifying resumes into different job categories. The model uses neural networks to learn complex relationships between candidate skills and job requirements. The system automatically identifies relevant candidate profiles and assigns them to appropriate job roles. Experimental results show that deep learning models achieve higher classification accuracy compared to traditional machine learning techniques.[5]

6) Sharma et al., “Intelligent Hiring System Using Artificial Intelligence” (2023): This study presents an intelligent hiring system that integrates AI technologies to automate the recruitment process. The system analyzes resumes using NLP techniques and evaluates candidates using a scoring mechanism based on predefined criteria. The proposed approach helps reduce recruiter workload and improves the consistency of candidate evaluation. The authors highlight the importance of AI in enhancing efficiency and transparency in recruitment systems.[6]

7) Chen et al., “Automated Interview Systems Using Artificial Intelligence” (2023): In this paper, the authors develop an AI-based automated interview system that generates interview questions based on candidate resumes and job descriptions. The system uses machine learning techniques to analyze candidate responses and evaluate their suitability for the role. The study demonstrates that automated interview systems can assist recruiters by conducting preliminary assessments and identifying strong candidates for further evaluation.[7]

8) Gupta et al., “Resume Screening Using Text Mining Techniques” (2022): This research focuses on the use of text mining techniques to analyze and process resume data. The proposed system extracts important keywords and skills from resumes and compares them with job requirements using similarity measures. The results show that text mining methods can effectively filter large numbers of resumes and help recruiters shortlist suitable candidates efficiently. [8]

9) Brown et al., “AI-Driven Talent Acquisition Systems” (2022): The authors investigate the role of AI-driven systems in modern talent acquisition processes. The study highlights how artificial intelligence can automate repetitive tasks such as resume screening, candidate ranking, and interview scheduling. The results indicate that AI-based recruitment tools

improve hiring speed, reduce operational costs, and provide better candidate matching compared to traditional hiring methods. [9]

10) Singh et al., “Smart Recruitment System Using Machine Learning and NLP” (2022): This study proposes a smart recruitment system that combines machine learning algorithms with natural language processing techniques to automate candidate evaluation. The system analyzes resumes, extracts key attributes, and ranks candidates according to their relevance to job requirements. The research concludes that the integration of machine learning and NLP significantly enhances recruitment efficiency and enables organizations to make faster and more accurate hiring decisions.[10]

### Proposed System

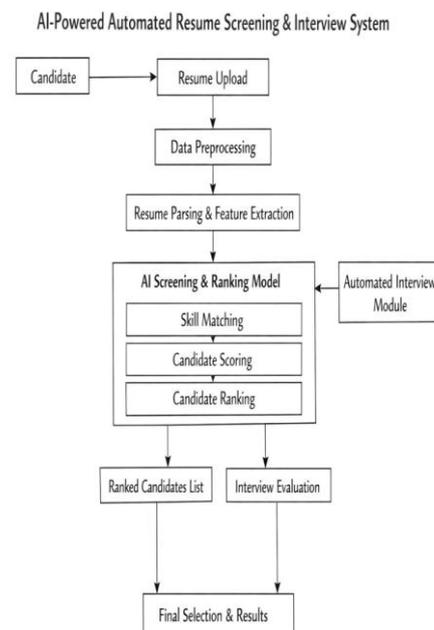


Fig 1: Proposed System Architecture

The proposed system for the AI-Powered Automated Resume Screening and Interview System aims to automate and improve the recruitment process by using artificial intelligence and machine learning techniques. The system is designed to assist recruiters by automatically analyzing candidate resumes, extracting relevant information, and identifying the most suitable applicants based on job requirements. By integrating Natural Language Processing (NLP) and machine learning algorithms, the system can process large volumes of resumes efficiently and reduce the time required for manual screening. The proposed system architecture begins with the resume submission stage, where candidates upload their resumes through the system

interface. These resumes may be in various formats such as PDF or text documents. Once the resumes are uploaded, the system performs data preprocessing, which includes cleaning the text, removing unnecessary characters, and converting the document into a structured format suitable for analysis. This step ensures that the extracted information is accurate and consistent for further processing. After preprocessing, the system performs resume parsing and feature extraction, where important candidate details such as skills, educational qualifications, work experience, and certifications are identified and extracted from the resume. Natural Language Processing techniques are used to analyze the textual content and identify keywords related to job requirements. The extracted features are then stored in a structured format to facilitate efficient comparison with job descriptions. In the next stage, the extracted features are processed using machine learning models to evaluate the suitability of candidates for a particular job role. The system compares candidate skills and qualifications with the job requirements and assigns a relevance score to each applicant.

### Methodology

The methodology for developing the AI-Powered Automated Resume Screening and Interview System involves several important stages to ensure accurate analysis and evaluation of candidate resumes. Initially, a dataset of sample resumes and job descriptions is collected and prepared for processing. These resumes are then converted into a machine-readable format so that the system can analyze the textual information effectively. Data preprocessing techniques such as text cleaning, tokenization, and removal of unnecessary characters are applied to improve the quality of the data. After preprocessing, Natural Language Processing (NLP) techniques are used to extract important features from the resumes. These features include candidate skills, educational qualifications, work experience, certifications, and other relevant information. The extracted features are then organized into structured data that can be used for further analysis and comparison with job requirements. Next, machine learning algorithms are applied to evaluate and classify candidate profiles based on their compatibility with the job description. The system analyzes the similarity between the candidate's skills and the required job skills and assigns a score to each applicant. Based on these scores, the candidates are ranked to identify the most suitable applicants for the position. In

addition to resume screening, the system includes an automated interview module that generates relevant interview questions based on the candidate's profile and job requirements. Candidate responses can be evaluated to assess their knowledge and suitability for the role. Finally, the system produces a ranked list of candidates along with evaluation results, assisting recruiters in making informed and efficient hiring decisions.

### Algorithm

#### a) Natural Language Processing (NLP)

Natural Language Processing (NLP) is used in the proposed system to analyze and understand the textual content present in candidate resumes. Resumes usually contain unstructured text that includes information such as skills, education, work experience, and certifications. NLP techniques help convert this unstructured data into structured information by performing tasks such as tokenization, keyword extraction, and text normalization. By identifying relevant keywords and phrases related to job requirements, NLP enables the system to extract meaningful features from resumes. This process helps the system accurately analyze candidate profiles and compare them with job descriptions for effective screening.

#### b) Logistic Regression:

Logistic Regression is a widely used machine learning algorithm for classification problems and can be applied in the resume screening process to determine whether a candidate is suitable for a specific job role. The algorithm analyzes extracted features such as skills, qualifications, and experience to predict the probability that a candidate matches the job requirements. Logistic Regression is computationally efficient and provides interpretable results, making it useful for initial candidate classification. Although it may have limitations in handling highly complex data patterns, it serves as a reliable baseline model for candidate evaluation. Logistic Regression.

#### c) Random Forest

Random Forest is an ensemble machine learning algorithm that builds multiple decision trees to improve prediction accuracy. In the proposed system, Random Forest can analyze various resume features and evaluate candidate suitability for job positions. By combining the results of several decision trees, the algorithm provides more stable and accurate predictions compared to a single decision tree model. Random Forest can also identify important features, such as key skills or qualifications that play a significant role in candidate selection. This makes it highly effective for ranking

candidates based on their compatibility with job requirements.

d) Decision Tree

Decision Tree is a simple and interpretable machine learning algorithm used for classification and decision-making tasks. In the resume screening system, the algorithm analyzes candidate information and creates decision rules based on different attributes such as skills, education, and experience. Each branch of the tree represents a decision condition that helps determine whether a candidate is suitable for a particular role. Decision Trees are easy to understand and implement, making them useful for explaining the selection process. However, they may sometimes overfit when dealing with

large and complex datasets.

e) Candidate Ranking Algorithm

The Candidate Ranking Algorithm is used to rank shortlisted applicants based on their relevance to the job description. After extracting features and evaluating candidate profiles using machine learning models, the system assigns a score to each candidate according to the similarity between their skills and the required job skills. Candidates with higher scores are considered more suitable for the position and are ranked at the top of the list. This ranking mechanism helps recruiters quickly identify the best candidates and simplifies the overall hiring process.

### Results and Discussions

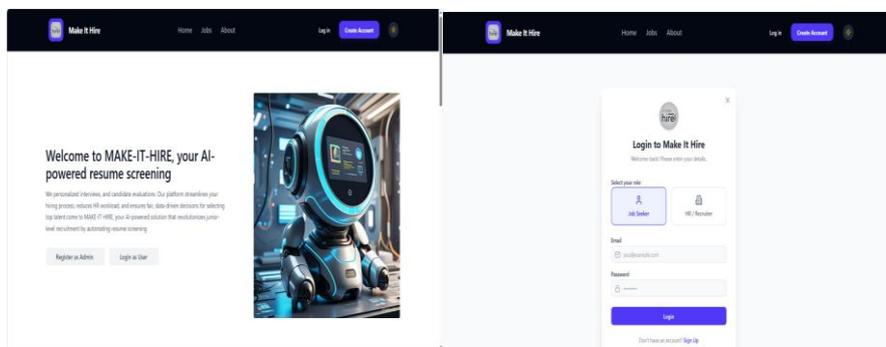


Fig 2: Login Page

This image represents the login page of the AI-powered automated resume screening and interview system. The login interface allows authorized users such as recruiters or administrators to securely access the system by entering their username and password. The purpose of this page is to ensure that only authenticated users can manage recruitment activities, upload job descriptions, and review candidate profiles. The simple and secure login interface provides controlled access to the recruitment platform and protects sensitive candidate data.

This screenshot illustrates the resume upload interface where candidates can submit their resumes for screening. The page provides an option to upload resume files in formats such as PDF or document files. Once the resume is uploaded, the system automatically processes the document and extracts relevant information such as skills, qualifications, and work experience. This feature simplifies the resume submission process and allows the system to analyze candidate information efficiently.

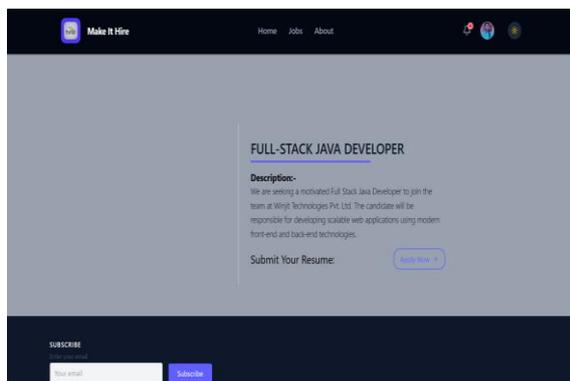


Fig 3: Upload Image

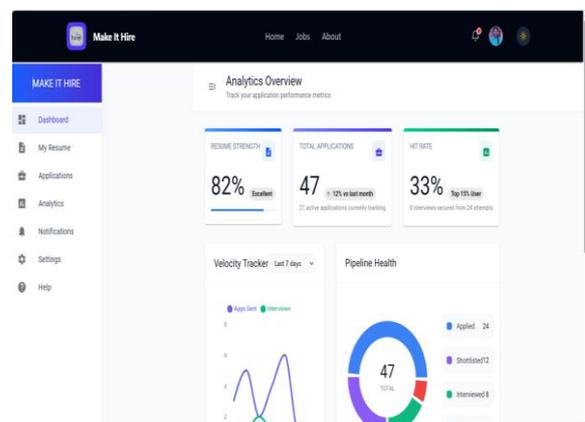


Fig 4: Resume Analysis Result

This image displays the result generated by the system after analyzing a candidate's resume. The system evaluates the uploaded resume using machine learning and natural language processing techniques to identify relevant skills and compare them with the job requirements. Based on this analysis, the system generates a compatibility score that indicates how well the candidate matches the job profile. The result helps recruiters quickly assess whether the candidate is suitable for further evaluation.

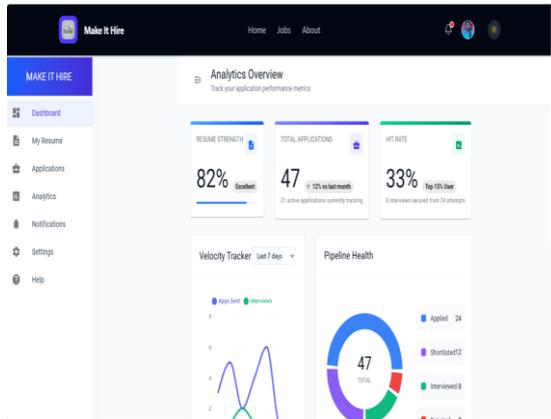


Fig 5: Candidate Score and Interview Evaluation

This screenshot represents the candidate ranking and interview evaluation stage of the system. After analyzing multiple resumes, the system ranks candidates based on their relevance to the job description. Additionally, the automated interview module can generate questions and evaluate candidate responses. The final output presents a ranked list of candidates along with evaluation scores, enabling recruiters to easily identify the most suitable applicants for the position.

### Conclusions

In conclusion, the implementation of an AI-powered automated resume screening and interview system provides an effective solution for improving the efficiency of the recruitment process. Traditional hiring methods often require significant time and effort from recruiters to manually review and evaluate a large number of resumes. By integrating machine learning and natural language processing techniques, the proposed system can automatically analyze candidate resumes, extract relevant information such as skills, qualifications, and work experience, and compare them with job requirements. The system helps recruiters identify suitable candidates more quickly and accurately by ranking applicants based on their compatibility with the job description. In addition, the

automated interview module assists in conducting preliminary interviews and evaluating candidate responses, further supporting the recruitment decision-making process. This reduces the workload of human resource professionals and allows them to focus on the most qualified candidates. Overall, the proposed system demonstrates the potential of artificial intelligence in transforming modern recruitment practices. By automating resume screening and supporting interview evaluation, the system improves hiring efficiency, reduces human bias, and enhances the overall candidate selection process. The adoption of such intelligent recruitment systems can help organizations streamline their hiring workflows and make more informed decisions when selecting potential employees.

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