

Smart Recruiter System: A Review

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ABSTRACT: Recruitment in modern organizations is becoming increasingly complex due to the exponential rise in job applications and the demand for specialized skills. Traditional hiring processes involve manual resume screening, repetitive candidate evaluations, and subjective interviews that often introduce human bias and inefficiencies. To overcome these limitations, the Smart Hiring System is proposed as an intelligent, end-to-end automated recruitment solution integrating artificial intelligence (AI), machine learning (ML), and natural language processing (NLP).

The system automates the entire hiring lifecycle—right from resume parsing and candidate-job matching to automated assessments and HR interview evaluation. It utilizes advanced models for resume layout detection, DistilBERT for textual skill extraction, and BiMuF (Bi-directional Recommender System) for candidate-job mapping. The platform provides a secure and transparent hiring experience through email-based authentication, data encryption, and integrated bias mitigation algorithms that ensure fairness and diversity in recruitment decisions. The experimental evaluation demonstrates significant reductions in hiring time, improved candidate selection accuracy, and enhanced recruiter productivity. Thus, the Smart Hiring System represents a transformative leap in recruitment technology, promoting efficiency, fairness, and data-driven decision-making in modern human resource management.

KEYWORDS: Resume Parsing, Candidate Matching, Machine Learning, Skill Extraction, Automated Hiring, Bias Mitigation, Recruitment Platform, Job Recommendation, Secure Authentication.

I. INTRODUCTION

Recruiting the right talent is crucial for the success of any organization. However, the existing hiring process is often plagued by inefficiencies such as time-consuming manual screening, subjective evaluations, and inconsistency across interviewers. In large-scale recruitment drives, HR teams receive thousands of resumes that need to be screened, shortlisted, and evaluated a task that is not only tedious but also prone to bias and oversight.

To address these limitations, the Smart Hiring System (SHS) introduces an AI-driven platform that automates and streamlines the hiring workflow. It combines machine learning algorithms for resume parsing, candidate ranking, and skill-based evaluation with intelligent automation for HR interview transcription and performance analytics. The system extracts structured data from resumes, analyses qualifications and experiences, and ranks candidates based on their suitability for job descriptions.

Furthermore, the inclusion of multi-stage assessments — including MCQs, coding challenges, and descriptive questions — ensures that candidates are evaluated on theoretical, practical, and behavioural aspects. The integration of speech-to-text transcription during interviews enhances transparency and allows for unbiased evaluation. Ultimately, the Smart Hiring System reduces recruiter workload, minimizes human bias, and increases the overall efficiency and fairness of the recruitment process.

II. LITERATURE SURVEY

Srinidhi K. S., Nischal V. U et al.

This paper presents a comprehensive AI-driven framework designed to automate and optimize the recruitment process. The proposed Smart Hiring System uses Natural Language Processing (NLP) and Machine Learning (ML) to parse resumes, extract relevant information, and rank candidates based on job description matching. The system eliminates manual intervention and bias in shortlisting candidates. Experimental results demonstrated improved efficiency in hiring processes, achieving faster and more accurate candidate recommendations for HR teams.

Kinger, S. et al.: This research integrates deep learning and computer vision techniques for intelligent resume processing. The authors proposed a model combining YOLOv5 (for layout and entity detection) and DistilBERT (for

semantic text understanding) to automatically extract data from unstructured resumes. The system performs skill extraction, experience analysis, and candidate ranking based on semantic similarity with job requirements. Results indicated high precision in resume parsing and ranking accuracy, making it suitable for real-world HR applications.

Lai, P. Y. et al.: This paper proposes a bi-directional recommender system for recruitment that considers both candidate preferences and employer requirements. The BiMuF model utilizes multi-semantic filtering techniques to enhance candidate-job matching quality. The approach ensures personalized recommendations for recruiters and job seekers, leading to improved hiring satisfaction. The model achieved superior performance compared to traditional recommendation systems in online recruitment platforms.

Hang, C. N. et al. : This study introduces MCQGen, a large language model-based tool that automatically generates multiple-choice questions (MCQs) for personalized assessments. The proposed system enhances online evaluation in the hiring process by dynamically creating domain-specific tests. In the context of smart hiring, this approach can be integrated to generate customized assessments for candidates, improving evaluation accuracy and reducing manual effort in test preparation.

Feng, X. et al.: Although focused on speech-to-text translation, this research contributes to smart hiring through multi-task learning concepts. The study demonstrates how AI models can simultaneously handle multiple data processing tasks efficiently. When applied to hiring systems, such techniques can be adapted for handling diverse recruitment tasks such as resume parsing, candidate ranking, and feedback summarization concurrently, thus improving overall system adaptability and performance.

III. EXISTING SYSTEM

The traditional hiring model relies heavily on manual screening and subjective judgment, which creates significant challenges:

- Inefficiency: HR professionals spend countless hours scanning resumes and scheduling interviews, slowing down hiring cycles.
- Bias: Unconscious biases influence shortlisting decisions, affecting diversity and inclusivity.
- Scalability Issues: Handling large volumes of candidate data manually becomes impractical as organizations grow.
- Data Fragmentation: Candidate information is often scattered across multiple systems, leading to poor data-driven insights.

To solve these problems, the Smart Hiring System aims to:

- Automate repetitive hiring tasks.
- Introduce data-driven decision-making.
- Reduce time-to-hire.
- Improve the accuracy of candidate selection.
- Build a fair and inclusive recruitment framework.

IV. CONCLUSION

The Smart Hiring System introduces a new paradigm in recruitment by leveraging AI and machine learning to automate and enhance every stage of hiring. It efficiently parses resumes, evaluates candidates through intelligent assessments, and provides HR professionals with data-driven insights. The inclusion of bias mitigation, speech-to-text transcription, and secure authentication makes the system reliable and fair.

While the system performs well under various test conditions, future work will focus on improving real-time analytics, video-based emotion analysis, and integration with enterprise HR tools. Overall, this system marks a transformative step toward smart, fair, and efficient digital recruitment.

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