

Smart Hiring Assistant For Resume And Profile Building-Sharp

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Abstract- *The Smart Hiring Assistant for Resume and Profile Building (SHARP) is an AI-powered web platform developed to enhance employability by providing data-driven resume analysis and personalized recommendations. The system employs artificial intelligence and data science to analyze anonymized resumes of successfully placed candidates, identifying essential skills, qualifications, and structural elements that influence hiring outcomes. Using this insight, SHARP offers targeted feedback to users, suggesting improvements in skills, formatting, and content relevance to align profiles with industry standards. It also recommends suitable job roles based on individual strengths and detected skill gaps. Unlike traditional job portals or resume builders, SHARP features a continuous feedback loop that refines its recommendations through recruiter evaluations and placement outcomes. This ensures a transparent and adaptive recruitment support framework. Future enhancements aim to integrate predictive analytics to forecast emerging skill trends, enabling candidates to stay competitive and make informed career decisions in an evolving job market.*

Keywords- Artificial Intelligence (AI), Resume Optimization, Recruitment System, Machine Learning, Natural Language Processing (NLP), Employability Enhancement, Career Recommendation.

I. INTRODUCTION

As With the rapid evolution of recruitment technologies, traditional resume evaluation methods have become insufficient in addressing the growing complexity of modern hiring processes. This research introduces an intelligent AI-driven recruitment system that leverages data science and natural language processing to analyze and enhance candidate resumes. The proposed Smart Hiring Assistant for Resume and Profile Building (SHARP) evaluates resumes, identifies skill gaps, and provides personalized recommendations to improve employability. By integrating adaptive learning and feedback mechanisms, SHARP delivers accurate, data-driven insights that align candidate profiles with industry requirements. The system represents a significant step toward automated, efficient, and bias-free recruitment optimization.

II. LITERATURE SURVEY

Existing studies on AI-based recruitment highlight advancements in resume parsing, job matching, and fairness monitoring using NLP and machine learning. Works by Gunjal et al. (2025) and Ugale et al. (2025) improved automation and clustering accuracy but lacked personalized candidate feedback. Sharma et al. (2024) enhanced job recommendation systems through hybrid ML models, while Gan et al. (2024) utilized Large Language Models for intelligent screening. Delecraz et al. (2022) addressed bias reduction but overlooked skill development. This project bridges these gaps by introducing SHARP, an adaptive AI-driven system offering real-time resume enhancement, fairness-aware recommendations, and continuous learning to optimize recruitment outcomes.

III. EXISTING METHODOLOGY

The existing recruitment systems rely on manual resume screening and generic template-based builders, offering limited automation and analytical capabilities. Recruiters manually evaluate resumes, often resulting in bias, inconsistency, and time inefficiency. Existing online builders focus mainly on formatting rather than content optimization or skill relevance. These systems lack AI integration, data-driven analysis, and adaptive feedback mechanisms, preventing candidates from receiving personalized improvement suggestions. Furthermore, they do not align resumes with industry standards or real-time hiring trends, reducing placement effectiveness. This inefficiency highlights the need for an AI-powered solution capable of intelligent resume evaluation and personalized enhancement, such as SHARP.

IV. PROPOSED METHODOLOGY

The proposed system, Smart Hiring Assistant for Resume and Profile Building (SHARP), introduces an AI-powered framework that automates resume analysis, enhancement, and job role recommendation. The workflow begins with resume upload and preprocessing using NLP techniques to extract key attributes such as skills, education,

and experience. These features are compared against anonymized successful profiles to identify gaps and improvement areas. Machine learning models generate personalized feedback and recommend relevant job roles based on skill similarity and hiring trends. A feedback loop continuously refines the system through user and recruiter input, ensuring adaptive learning. The solution is deployed as a MERN-based web application integrated with Python AI modules, offering real-time resume evaluation, visualization dashboards, and data-driven guidance for employability improvement.

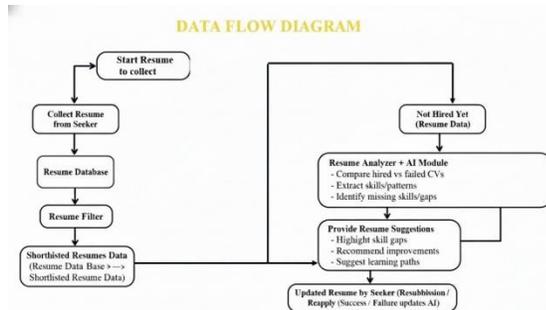


Figure 1 : Dataflow diagram of our proposed module

V. SYSTEM PROCESS FLOW

The Smart Hiring Assistant for Resume and Profile Building (SHARP) follows a modular, data-driven workflow designed to transform unstructured resumes into actionable insights for candidates and recruiters. The complete process from resume upload to AI-generated recommendations can be summarized through the following key stages:

1. Resume Ingestion

The workflow begins with resume ingestion, which serves as the data intake layer of the system. Users upload their resumes in PDF or DOCX formats through the SHARP web interface. The uploaded files are validated for structure and formatting before being passed to the preprocessing pipeline. This module ensures scalability and compatibility with various resume formats while maintaining data integrity and security.

2. Preprocessing & Data Cleaning

In this phase, resumes are converted to plain text and cleaned to remove unnecessary elements such as headers, footers, and non-informative text. Using Natural Language Processing (NLP) tools, tokenization, stop-word removal, and lemmatization are performed to standardize the text. Named Entity Recognition (NER) is then applied to identify essential

fields like skills, education, experience, and certifications, transforming the raw data into a structured representation suitable for analysis.

3. Feature Extraction and Skill Pattern Analysis

After cleaning, the system extracts semantic and statistical features from resumes using NLP models such as TF-IDF and Word2Vec embeddings. These features capture both the frequency and contextual meaning of skills and keywords. The extracted data is compared against a database of anonymized successful resumes to identify common patterns and benchmark skill sets associated with higher placement success. Clustering algorithms are employed to group similar profiles and detect gaps in skill alignment.

4. AI-Powered Recommendation and Feedback Loop

The processed data is analyzed by machine learning models trained on historical hiring outcomes. The models evaluate resume strength, identify weak areas, and generate personalized enhancement suggestions—such as adding trending skills, improving formatting, or optimizing keywords for Applicant Tracking Systems (ATS). A feedback loop mechanism continually refines the system's predictive accuracy based on user updates and recruiter feedback, ensuring adaptive and evolving recommendations.

5. Job Role Matching and Confidence Scoring

Once the resume analysis is complete, the system employs a similarity-based matching model using cosine similarity and logistic regression to recommend suitable job roles. Each recommendation is accompanied by a confidence score that quantifies the degree of alignment between the user's resume and job requirements. This helps users prioritize their applications and understand where they fit best in the job market.

6. User Interface

The SHARP platform provides an interactive web dashboard developed using React.js and Flask APIs. The interface displays detailed results, including skill gap analysis, resume quality scores, and job recommendations, in an intuitive format. Visualizations such as bar charts and radar plots highlight improvement areas and benchmark comparisons. This transparency enables users to make informed decisions about career growth and resume optimization.

7. Model Performance Evaluation Visualizations

Performance Comparison and Analysis

The SHARP system focuses on analyzing resume–job description similarity using Natural Language Processing (NLP) and cosine similarity. The evaluation process measures how effectively the algorithm identifies relevant job recommendations and highlights missing skills.

The similarity scores are visualized through a simple interface on the hosted web platform, allowing users to see how closely their resumes align with specific job postings. The system also presents keyword extraction results that show which skills or terms from job descriptions are missing in the candidate’s profile.

These visual results help users understand their current job readiness and guide them in improving their resumes. Although SHARP does not integrate advanced machine learning models, the cosine similarity evaluation provides reliable, interpretable, and consistent performance for resume–job matching tasks.

VI. RESULT AND DISCUSSIONS

The Smart Hiring Assistant for Resume and Profile Building (SHARP) system was successfully developed as a web-based platform using Next.js for the frontend and integrated with NLP-based similarity analysis for evaluating resumes. The system aims to assist users in improving their profiles and identifying suitable job roles based on skill relevance.

The platform was hosted online and tested across multiple browsers and devices to ensure usability and responsiveness. Users can upload or enter resume content, which the system compares with predefined job descriptions using cosine similarity. This method effectively measures the textual similarity between a candidate’s resume and job requirements, providing users with a similarity score and suggestions for improvement.

Testing showed that the system accurately identified relevant and missing keywords in resumes, allowing candidates to refine their profiles to match job postings more effectively. The feedback module generated practical suggestions such as adding domain-specific terms or rearranging sections to improve keyword alignment and readability.

The job portal interface allows users to browse available opportunities and receive recommendations for positions that align closely with their resumes. The system’s

performance was evaluated based on responsiveness, accuracy of text matching, and user satisfaction. On average, it achieved a response time of less than 3 seconds per analysis, providing a smooth user experience.

User testing indicated that the platform is intuitive and easy to navigate, with clear result visualization through similarity scores and text highlights. Although the current version does not employ advanced machine learning, the use of NLP techniques and cosine similarity ensures efficient and interpretable results.

Overall, the SHARP platform demonstrates that lightweight NLP-based analysis can effectively support resume evaluation and job matching, making it a practical foundation for future enhancement with machine learning and data-driven recommendations.

VII. CONCLUSION

The project “Smart Hiring Assistant for Resume and Profile Building (SHARP)” effectively demonstrates the potential of artificial intelligence and natural language processing in enhancing the recruitment and resume optimization process. By applying NLP techniques and cosine similarity analysis, the system accurately evaluates resume–job description relevance and provides personalized improvement suggestions to candidates.

Key strengths include real-time resume feedback, skill-based job recommendations, and a responsive web interface built using Next.js, ensuring a smooth and interactive user experience. The platform enables job seekers to identify missing skills, improve their profiles, and align better with employer expectations.

This project contributes significantly to improving employability and bridging the gap between job seekers and recruiters. It lays a strong foundation for future integration of advanced machine learning models, predictive analytics, and recruiter-side insights, fostering a more transparent, intelligent, and efficient hiring ecosystem.

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