

AUTOMATED RESUME ANALYSIS AND SKILL SUGGESTING WEBSITE USING NLP

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Abstract: This project presents an automated resume analysis and skill suggesting website using Natural Language Processing (NLP) techniques. The system extracts key information such as skills, education, and experience from resumes and compares them with job descriptions to evaluate candidate suitability. It generates an ATS-like score to measure resume effectiveness and identifies missing skills required for specific roles. The system provides personalized recommendations to improve the resume and enhance job readiness. It supports multiple file formats and performs accurate text processing for reliable results. Overall, the proposed system reduces manual effort, speeds up resume evaluation, and helps job seekers increase their chances of selection through intelligent analysis.

Keywords: Automated Resume Analysis, Natural Language Processing (NLP), Resume Parsing, Skill Extraction, ATS Scoring, Skill Recommendation System, Text Analysis, Job Matching, Machine Learning, Information Extraction, Keyword Matching, Semantic Analysis, Document Classification, Career Guidance, Recruitment Automation, Data Processing, Resume Screening, Intelligent Systems.

1. INTRODUCTION

Automated resume analysis enables users to evaluate and improve their resumes using intelligent text processing. This project presents a web-based system where users can upload resumes for analysis. Natural Language Processing (NLP) is used to extract key details like skills, education, and experience. The system compares resumes with job descriptions and generates an ATS-like score. It also suggests missing skills to help users improve their chances of getting selected.

2. LITERATURE SURVEY

Automated resume analysis has gained significant importance in the recruitment process for improving candidate evaluation. Earlier methods relied on manual resume screening, which was time-consuming and less efficient. Recent approaches use Natural Language Processing (NLP) techniques for extracting and analyzing resume content. These advancements enable accurate ATS scoring and better matching with job descriptions. As a result, resume analysis systems have become more efficient, reliable, and helpful for job seekers.

From the reviewed literature, the following key observations can be made:

- Early systems relied on manual resume screening methods.
- NLP techniques enable automatic extraction of key information from resumes.
- Modern systems focus on improving accuracy and job-role matching.

3. PROPOSED SYSTEM

The proposed system focuses on providing an intelligent and automated way to analyze resumes and suggest relevant skills based on industry requirements. It uses Natural Language Processing (NLP) techniques to extract important information from resumes and compares it with job descriptions. The system helps users understand their strengths and identify missing skills required for better job opportunities. It aims to provide a simple, efficient, and user-friendly platform for resume evaluation and improvement.

Resume Processing and Information Extraction

The system processes resumes in digital format and extracts relevant information such as technical skills, educational qualifications, and work experience. NLP techniques like tokenization, stop-word removal, and keyword extraction are applied to clean and structure the text. Tools such as spaCy and NLTK help in identifying important entities and keywords from the resume.

Similarity Calculation and Skill Recommendation

After extracting the required information, the system compares the resume data with job descriptions using similarity measures like cosine similarity. Based on this comparison, an ATS (Applicant Tracking System) score is generated. The system identifies gaps between the candidate's skills and job requirements and suggests relevant skills to improve employability.

User Interface and Result Visualization

The system provides a simple and interactive interface where users can upload their resumes and view analysis results. It displays the ATS score, matched keywords, missing skills, and improvement suggestions. The results are presented in a clear and structured format, enabling users to easily understand their performance.

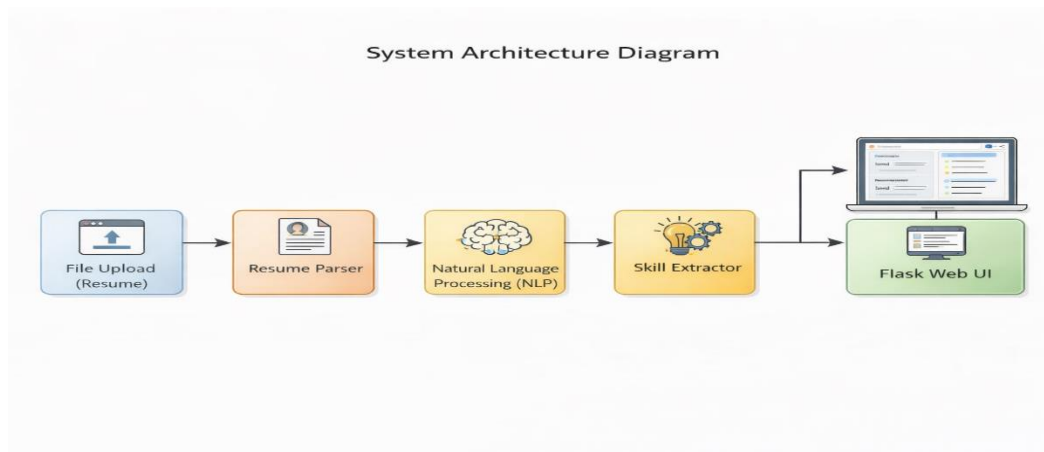


Fig 1: Proposed System

The system provides an automated way to analyze resumes and suggest relevant skills using Natural Language Processing (NLP). It extracts key information such as skills, education, and experience, compares it with job descriptions, and generates an ATS-like score to evaluate resume effectiveness. The system identifies missing skills, highlights important keywords, and provides suggestions to improve resume quality.

It allows users to upload resumes and receive real-time feedback along with improvement tips. The system performs text preprocessing, keyword matching, and semantic analysis to ensure accurate evaluation. The

results are displayed in a simple and user-friendly format for better understanding. Overall, the system reduces manual effort, speeds up resume screening, and helps job seekers increase their chances of resume shortlisting by aligning their profiles with industry requirements.

4. METHODOLOGY

The methodology of the system is organized into the following steps:

1. Initialization: Load the required libraries such as NLP tools and other dependencies for text processing. Initialize the system interface to allow users to upload resumes.
2. Resume Upload: Allow the user to upload a resume in PDF format. Read and extract the text content from the uploaded file.
3. Preprocessing: Clean the extracted text by removing stop words, punctuation, and unnecessary symbols. Perform tokenization and normalization to prepare the text for analysis.
4. Information Extraction: Extract important details such as skills, education, and experience using NLP techniques. Identify keywords and relevant entities from the resume.
5. Job Description Input: Provide or load a job description for comparison. Preprocess the job description text similar to the resume data.
6. Feature Extraction: Convert both resume and job description text into numerical representations using techniques like TF-IDF or word embeddings.
7. Similarity Calculation: Compute similarity between the resume and job description using cosine similarity. Generate an ATS-like score based on matching keywords and skills.
8. Skill Gap Analysis: Identify missing or weak skills by comparing resume content with job requirements. Determine areas where improvement is needed.
9. Recommendation Generation: Suggest relevant skills and improvements to enhance the resume. Provide actionable feedback to the user.
10. Result Display: Display the ATS score, matched skills, missing skills, and suggestions through a user-friendly interface.
11. Loop Process: Allow users to update and re-upload resumes for continuous improvement. Repeat the process until the user is satisfied with the results.

5. PROPOSED SYSTEM RESULTS

The proposed system successfully analyzes resumes and provides skill suggestions using NLP techniques. The system accurately extracts key details such as skills, education, and experience from uploaded resumes. Users can effectively evaluate their resumes through ATS-like scoring and improve them based on suggested skills. The response time of the system is fast, providing quick and efficient analysis. The system performs well with different resume formats and ensures reliable results. Overall, the results demonstrate that the proposed system offers an efficient, user-friendly, and intelligent solution for resume evaluation and improvement.

- Real-time resume analysis with good accuracy.
- Quick ATS scoring and fast response time.
- Effective skill suggestions without manual effort.

The response time of the system was fast, and balancing actions were initiated without noticeable delay.

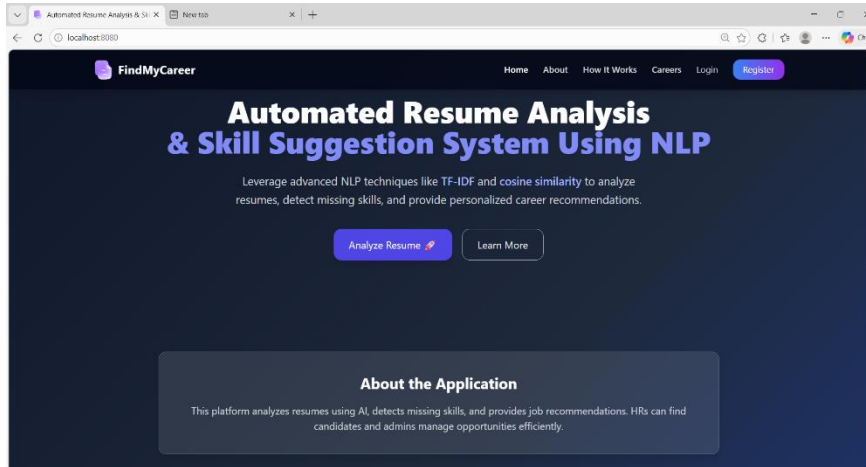


Fig 2: User Interface

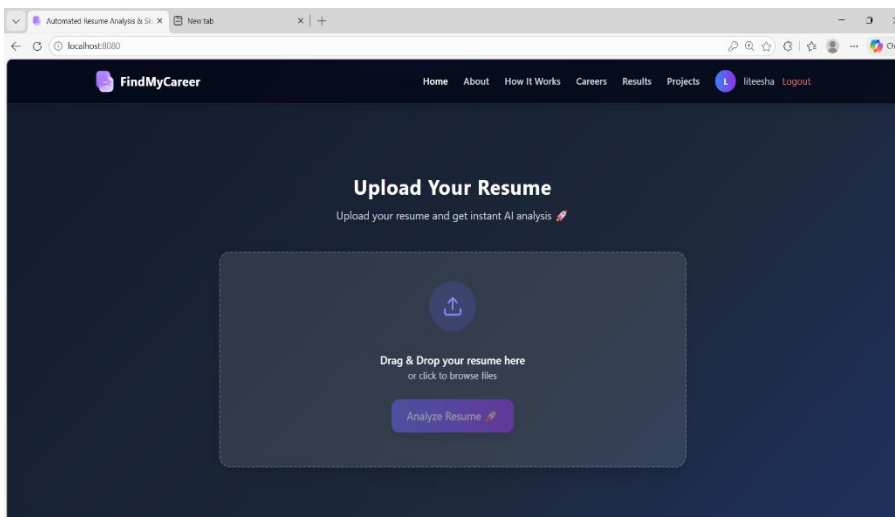


Fig 3: Resume upload

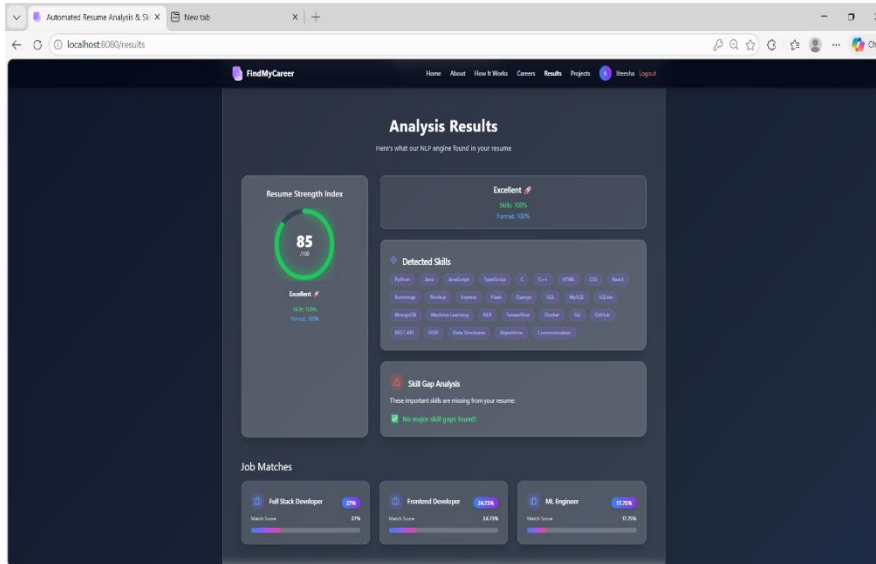


Fig 4.1: Resume analysis result

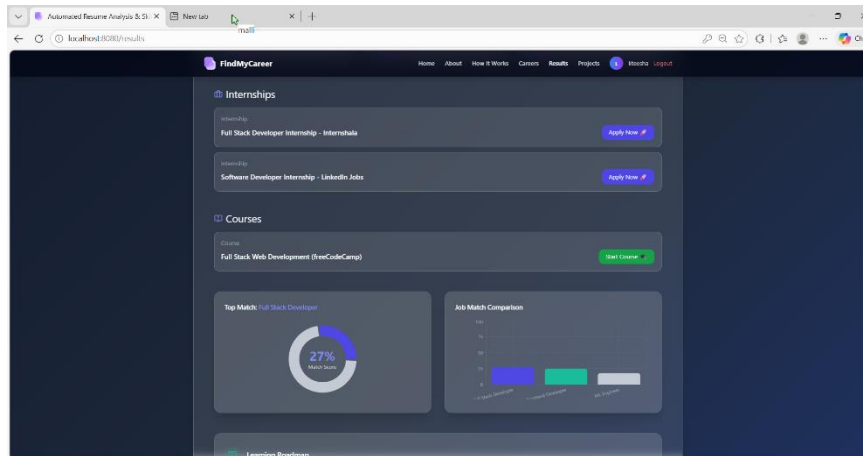


Fig 4.2: Resume analysis result

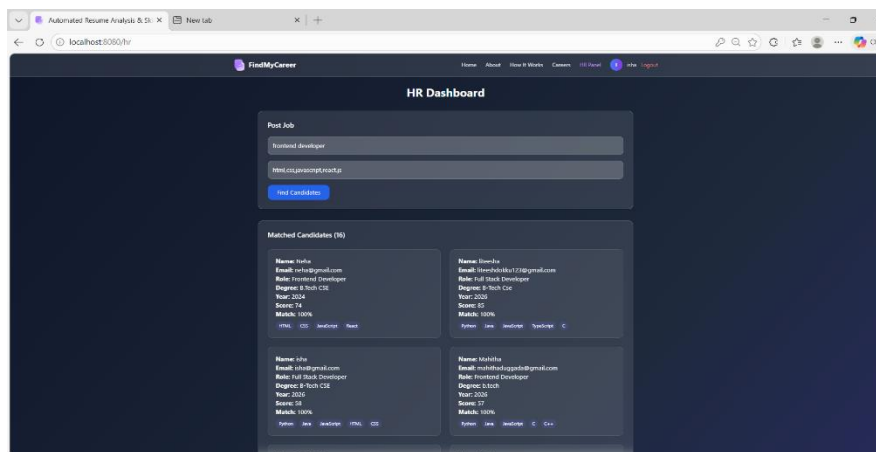


Fig 5: HR Dashboard

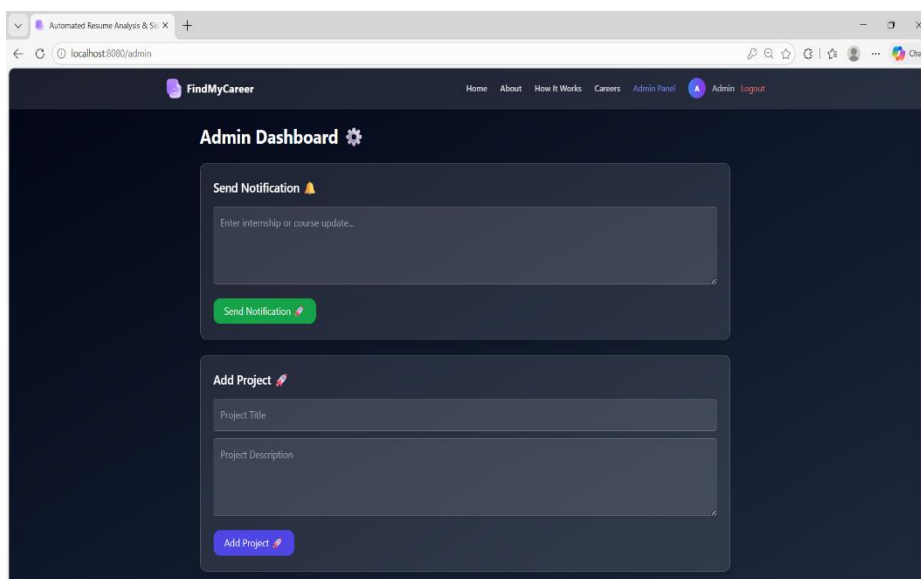


Fig 6: Admin Dashboard

Overall, the system demonstrated reliable performance in Capturing, detecting and performing operations.

6. CONCLUSION

The proposed Automated Resume Analysis and Skill Suggestion System using NLP provides an efficient and intelligent solution for evaluating and improving resumes in today's competitive job market. The system successfully analyzes resume content by extracting key information such as skills, education, and experience, and compares it with job descriptions to generate an ATS-like score. By identifying missing skills and suggesting relevant improvements, it helps users align their profiles with industry requirements. The use of Natural Language Processing techniques ensures accurate and fast processing, making the system reliable across different resume formats. It reduces the dependency on manual resume screening and provides consistent, unbiased evaluation. The user-friendly interface and clear visualization of results make it easy for users to understand their strengths and weaknesses. Additionally, features like keyword matching, real-time feedback, and skill recommendations support continuous learning and profile enhancement. Overall, the system enhances job readiness, increases the chances of selection, and simplifies the recruitment process, making it a valuable tool for students and job seekers aiming to build strong and effective resumes.

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