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Modern Real - Time Resume Analysis and Job Suggestion System Using NLP and Machine Learning Algorithm

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ABSTRACT

This paper is about in today's highly competitive job market job seekers face significant challenges in optimizing their resumes to pass Applicant Tracking Systems (ATS) and align with job requirements. Many resumes are rejected due to missing keywords, improper formatting, or a lack of ATS-friendly structures, making it difficult for qualified candidates to secure interviews. To address this issue, we present an AI-powered resume analysis system that enhances job matching efficiency by leveraging natural language processing (NLP) and machine learning. This system extracts key skills, qualifications, and experience from job descriptions and compares them with resumes to identify gaps. By providing automated keyword suggestions, ATS optimization insights, and personalized resume recommendations, the model improves resume-job relevance and significantly increases the likelihood of passing ATS filters. The results demonstrate that integrating AI in the resume screening process enhances job application success rates, reduces manual effort for both job seekers and recruiters, and accelerates the hiring process.

1. INTRODUCTION

The job market today is highly dynamic and competitive, requiring job seekers to craft resumes that not only showcase their qualifications but also meet the criteria set by automated hiring systems. Many organizations use Applicant Tracking Systems (ATS) to filter and rank job applications, making it imperative for candidates to structure their resumes in an ATS-compatible manner. However, manually optimizing a resume for different job applications is both time-consuming and complex. Traditional resume screening methods rely heavily on recruiters spending hours reviewing applications, which is inefficient given the increasing volume of applicants for each job posting. This creates a gap where qualified candidates may be overlooked due to improper

formatting, missing keywords, or lack of alignment with the job description. Addressing these challenges requires an AI-powered system that automates resume analysis, ensuring alignment with job postings while enhancing the efficiency of the recruitment process. The proposed AI-powered resume analysis and job matching system leverages advanced Natural Language Processing (NLP) and Machine Learning (ML) to extract essential information from resumes, compare them with job descriptions, and provide actionable recommendations. By automating the resume evaluation process, this system significantly increases the likelihood of candidates passing ATS filters, improves job relevance, and enhances the overall efficiency of the hiring process. The modern job market is highly competitive, making it essential for job seekers to optimize their resumes to stand out. Many companies use Applicant Tracking Systems (ATS) to filter resumes based on keyword relevance, skills, and job descriptions. This study presents an AI- powered resume analysis system that enhances ATS compatibility, improves job relevance, and increases job seekers' chances of securing interviews.

2. PROSPECTIVE APPLICATION

AI-Powered - Like Resume Analyzer our model aims to help job seekers optimize their resumes for Applicant Tracking Systems (ATS) and increase their chances of getting hired by using AI-driven resume analysis and job matching techniques.

A. ATS Resume Optimization

Many companies use Applicant Tracking Systems (ATS) to filter resumes. Our models helps job seekers optimize their resumes to pass ATS screening by Extracts keywords & skills from job descriptions. Compares them with the resume to identify missing keywords. Suggests resume improvement for better ATS compatibility.

B. Improving Job Match & Relevance

Helps job seekers customize their resumes for specific Job applications. Provides tailored recommendations to improve job relevance. Example:

If a job description requires Python, or mobile app developer and AWS, but the resume only has Python and AI, the system will recommend adding app dev and AWS projects or certifications.

Real-World Impact of Our Model: Helps job seekers get more interview calls by optimizing resumes. Creating more enhanced resume Improves ATS pass rates by ensuring resumes have the right keywords.

User-Friendly & Interactive UI: Build a clean, interactive, and user- friendly web interface using Streamlit. Implement smooth animations, loading effects, and a responsive layout.

Real-Time Resume Analysis: Our system instantly analyses resumes, extracts skills, and compares them with job descriptions. It saves recruiters from manually going through resumes and gives job seekers quick in sightson improving their resumes. If a resume is missing important skills like Python or AWS for a data science job, our system will highlight that instantly.

Reducing Job Seekers' Time: Instead of job seekers spending hours modifying resumes for each job, our system does it insecondsIt gives instant feedback on missing keywords, skills, and ATS compatibility, so job seekers can quickly improve their resumes.

Improving Accuracy in Candidate-Job Enhancing Resume Efficiency: We ensure resumes are structured well, ATS-friendly, and easy to read. It improves resume visibility in company hiring systems and helps candidates highlight their strengths better. If a resume has long, unstructured paragraphs, our system suggests bullet points for clarity and ATS optimization.

3. WORKFLOW OF SYSTEM

The system follows a structured process that begins when a user uploads a resume in PDF format along with a job description. The system then extracts textual data from the resume using Natural Language Processing (NLP) to analyze key details such as skills, experience, and education. Simultaneously, the job description is parsed to identify essential qualifications and required competencies. The extracted resume data is then fed into the Google Gemini 1.5 Pro AI model, which performs an in-depth comparison between the resume and job description, highlighting missing skills and qualifications and generating an ATS compatibility score based on keyword matching and formatting adherence. The AI then provides actionable recommendations such as adding missing keywords (e.g., Python, AWS, NLP), improving resume structure, and optimizing formatting to enhance readability and ATS compliance. The user receives a detailed feedback report, allowing them to refine their resume accordingly. Once optimized, the resume can be exported in an ATS-compatible format, increasing its likelihood of passing automated screening processes. By automating resume analysis, job matching, and enhancement suggestions, the system significantly reduces manual effort, enhances hiring efficiency, and improves job seekers' chances of securing interviews.

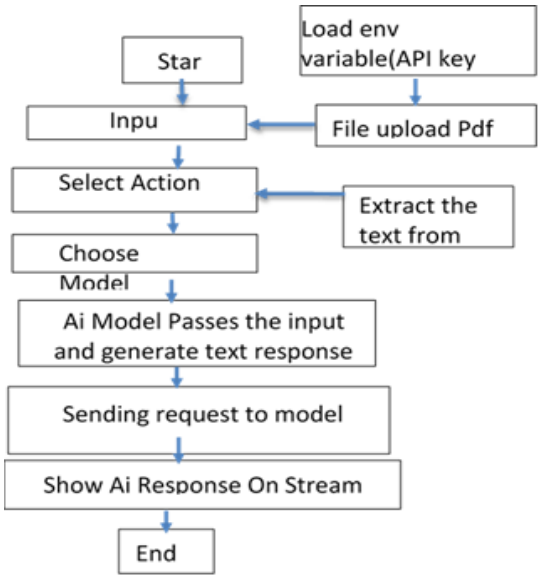

Figure1: Flowchart

4. EMPERICAL ANALYSIS AND RESULT

Increased Effectiveness in Recruiting: By automating resume creating using given templates screening, the system helps recruiters save time and effort in case of manual formatting it is less dependent on manual procedures.

Reliable Candidate-Job Matching: The system efficiently matches resumes to job descriptions by utilising AI resume suggestions. The approach highlights a candidate's fit for a given role by providing a percentage match score.

Instantaneous Feedback and Suggestions: The application provides job searchers with immediate suggestions for resume keyword optimisation and skill enhancement.

Scalable and Customisable Design: The system may be tailored to meet the needs of various industries, job categories, and hiring processes such as applicant tracking systems and job portals is part of it.

Better Candidate Experience: Jobseekers get tailored career path advice and job recommendations. By giving resumes useful feedback, the system increases user engagement.

Table 1: Performance Evaluation

METRIC	RESULT
Approximately	80-85
Real Time Capability	Yes
Processing Speed	24-30 FPS
Variation	5-10%

CHALLENGES AND FUTURE SCOPE

Multi-Format Resume Processing:
Increasing accessibility for a wider range of consumers by extending support beyond PDFs to include resumes in DOCX, TXT, and picture formats.

Multilingual Resume Analysis: Using models to process resumes in several languages makes the system suitable for international (hiring). Personalised job recommendations based on candidates own profile

Date abilities, career trajectory: The market trends are provided via an advanced job recommendation system that integrates deep learning models.

Creating an AI-powered interview assistant that offers automated practice interviews, response feedback, and personality tests is known as AI-Driven Interview Coaching.

Integration with Recruitment Platforms: Facilitating smooth communication with corporate applicant tracking systems, Indeed, LinkedIn, and other platforms so that job searchers may submit applications straight through the system.

Real-Time Labour Market Analysis: By using AI to examine hiring patterns in the industry, job seekers can better match their resumes to employers' demands and new talents.

Voice and Chat-botSupport: Presenting conversational AIbotsto assist users interactively with job application and resume optimisation procedure

CONCLUSION

In this paper we have presented a Modern Real-Time Resume Analysis and Job Suggestion System using NLP and Machine Learning algorithms has successfully demonstrated the potential to chances to get hired. By leveraging Natural Language Processing (NLP), the system can efficiently extract relevant information from resumes, such as skills, experience, and qualifications, while Machine Learning algorithms based model can match candidates to suitable job roles based on their profiles. This approach offers several advantages over traditional manual methods, including speed, accuracy, and scalability. Similarly, job seekers gain personalized job suggestions that are better aligned with their qualifications, increasing their chances of securing relevant positions

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