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Next-Gen Resume Scoring and Analysis Platform with AI Chatbot Assistance Powered by LLM Technology

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Abstract - This paper introduces an innovative NLP-driven tool designed to assist job seekers by automating resume analysis and offering real-time career advice. By integrating OCR, SBERT for entity extraction, and Llama 3.2 for chatbot interactions, this solution addresses key challenges in resume optimization and personalized career support. The tool's capabilities streamline ATS scoring and enhance user engagement through interactive guidance.

***Key Words*:** Resume Parsing, ATS Scoring, LLM, Career Assistant, Text Extraction, Analyzer

1.INTRODUCTION

In today's competitive job market, job seekers are often required to tailor their resumes for different job applications while also seeking reliable career guidance. This process can be time-intensive and prone to oversight, resulting in missed opportunities. The need for an automated system that combines comprehensive resume parsing, ATS scoring, and real-time career assistance is evident. This paper introduces an NLP-driven tool that employs pre-trained language models to automate the extraction of essential resume information, evaluate ATS compatibility, and provide job seekers with interactive assistance via a chatbot. By integrating advanced technologies such as SBERT and Llama 3.2, this project aims to streamline the job application process and enhance user experience.

2. BODY OF THE PAPER

A. Why do we need this project

1) The job market is highly competitive, and job seekers often struggle to create resumes that pass ATS filters and align with job requirements. Additionally, finding tailored career advice can be challenging, leaving many applicants without the support they need to strengthen their job applications. Existing tools typically focus on either resume analysis or career assistance but fail to integrate both seamlessly. This project addresses these gaps by offering a comprehensive, automated solution that not only evaluates resumes for ATS compatibility but also provides real-time, personalized career guidance through a chatbot. This dual- function tool aims to save job seekers valuable time, enhance resume quality, and improve the overall job application process.

2) Objectives:

- Automate resume data extraction.
- Provide ATS score evaluation.
- Offer real-time career guidance.
- Enhance resume customization efficiency.
- Streamline the job application process.

B. Methodology

OCR Processing:

OCR (Optical Character Recognition) is a vital component of the "Next-Gen Resume Scoring and Analysis Platform," enabling the extraction of text from resumes in formats like scanned PDFs or images. Using tools such as Tesseract OCR, the system preprocesses resume by converting them to grayscale, reducing noise, and de-skewing for enhanced accuracy. It then recognizes and extracts key details such as names, contact information, skills, and education, even from complex layouts. The extracted text is cleaned and structured for subsequent stages like feature extraction and ATS scoring, ensuring that resumes in various formats can be processed seamlessly.

Named Entity Recognition (NER):

Named Entity Recognition (NER) using SBERT (Sentence-BERT) is a key feature of the "Next-Gen Resume Scoring and Analysis Platform" that identifies and categorizes essential information from resumes, such as names, skills, education, and contact details. SBERT, a fine-tuned transformer-based model, enables contextual understanding of text, making it highly effective for accurately extracting named entities even in unstructured or complex formats. By leveraging SBERT's semantic similarity capabilities, the platform matches phrases and terms in resumes with predefined entity categories, ensuring precise and efficient information extraction. This process helps streamline data processing and improves the accuracy of subsequent ATS scoring and analysis.

ATS Compatibility Scoring:

The ATS compatibility scoring mechanism evaluates how well a resume aligns with job descriptions by analyzing key attributes such as skills, qualifications, and experience. Using advanced NLP techniques and similarity metrics powered by SBERT, the platform compares extracted resume information with the job description. It calculates a compatibility score and provides a visual representation, helping job seekers understand their alignment with the job requirements and offering actionable feedback for improvement.

NLP-Based Chatbot Integration:

The NLP-based chatbot integration in the "Next-Gen Resume Scoring and Analysis Platform" leverages advanced LLM technology, specifically Llama 3.2, to provide personalized assistance to users. Integrated using Ollama, the chatbot uses natural language processing to engage in meaningful, human-like conversations, offering career guidance and resume improvement tips. It analyzes the user's skills and job preferences, providing suggestions to bridge skill gaps and enhance job readiness. Additionally, the chatbot acts as an interactive mentor, enabling users to ask questions, clarify doubts, and receive tailored advice, ensuring an intuitive and user-friendly experience throughout the platform.

Backend Development:

Python serves as the backbone for implementing core functionalities such as OCR, NLP operations, and SBERT-based feature extraction. Streamlit is used to streamline backend processes, handling user inputs, executing ATS scoring, and coordinating interactions between modules like resume parsing and chatbot integration. The backend ensures seamless data flow, efficient processing, and real-time generation of outputs.

Frontend Interface:

The platform's front-end interface is designed with Streamlit, offering an intuitive and interactive experience. It allows users to upload resumes, view analysis results, and engage with the chatbot effortlessly. The streamlined interface ensures smooth navigation between functionalities, delivering a professional and user-friendly experience.

3.CONCLUSION

The **Next-Gen Resume Scoring and Analysis Platform with AI Chatbot Assistance Powered by LLM Technology** is a transformative tool designed specifically to empower job seekers in their career journeys. By leveraging advanced technologies like OCR, NLP, and SBERT, the platform simplifies the process of resume refinement through precise parsing, skill alignment, and ATS scoring. With the integration of **Llama 3.2** via Ollama, users gain personalized guidance and actionable feedback to enhance their resumes and improve their chances of landing desired roles.

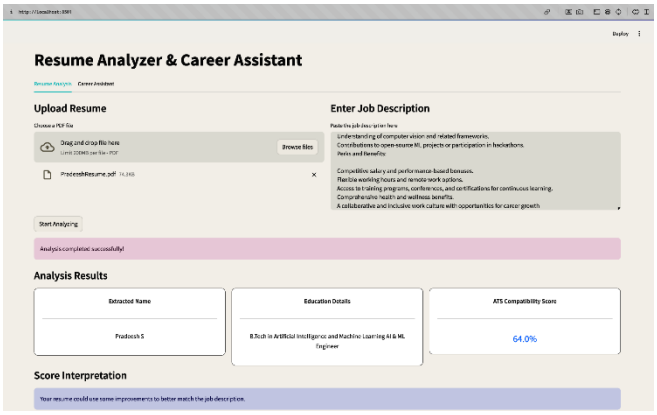
This project eliminates the guesswork involved in resume preparation, providing job seekers with clarity on how their resumes match specific job descriptions. The combination of AI- driven analysis and conversational assistance ensures a smooth and interact ive experience, setting a new standard in resume optimization tools. With its innovative features, the platform stands as a game-changer for individuals looking to elevate their job applications and achieve professional success.

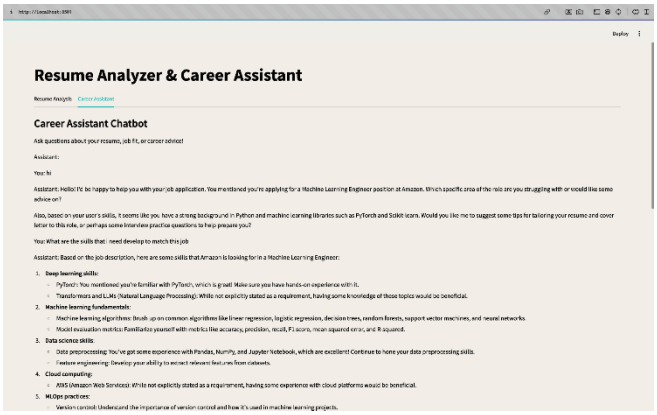
4.FUTURE ENHANCEMENT

The platform has immense potential for growth and adaptation to meet evolving user needs and technological advancements. Future enhancements could include multi-language support for global accessibility, enabling resume analysis in various regional and international languages. Integration with advanced recommendation engines can suggest personalized career paths, certifications, and skill-building courses based on industry trends and user aspirations. Additionally, incorporating video and audio analysis for digital interviews alongside the textual resumes could revolutionize talent evaluation processes. Real-time job matching, driven by advanced AI models, can instantly

notify users of relevant opportunities. Enhanced privacy features, such as blockchain for secure data storage, could strengthen user trust. These upgrades aim to transform the platform into a comprehensive ecosystem for end-to-end career guidance and talent acquisition.

5.RESULT





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