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Resume Analyzer with Optimization and Job Recommendation System

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Abstract: The Resume Optimizer and Job Recommendation System project aims to modernize the job application and recruitment process through a unified digital platform integrated with artificial intelligence. This system allows job seekers to create ATS-compliant resumes, browse and apply for jobs, and receive personalized job recommendations through a user-friendly interface. Employers can post job listings, manage candidate applications, and utilize AI-based tools for automated resume screening and applicant ranking. A central feature of the platform is its AI engine, which performs resume parsing, skill matching, and job alignment based on candidate profiles and employer requirements. The system supports multiple user roles, including job seekers, employers, and administrators, each with rolespecific functionality for streamlined operations. Additional features include a resume builder, skill assessment modules, quiz evaluations, and LinkedIn integration for enhanced candidate profiling. Administrators can monitor platform usage, manage user accounts, and generate detailed recruitment analytics. Overall, this platform enhances efficiency and decision-making in the recruitment ecosystem by leveraging AI for data-driven insights, automated workflows, and intelligent job-candidate matching.

Keywords: Resume Builder, Job Recommendation, Artificial Intelligence, ATS Optimization, Candidate Ranking, Skill Assessment, Recruitment Automation, Digital Platform, Career Portal

I. INTRODUCTION

Background

In today's competitive job market, both job seekers and recruiters face significant challenges. Job seekers often struggle to find positions that align with their skills and aspirations, while recruiters must sift through large volumes of resumes to identify qualified candidates. Additionally, the increasing use of automated recruitment systems and Applicant Tracking Systems (ATS) has made it more difficult for candidates to get noticed without optimized resumes and professional profiles. This calls for an intelligent and efficient solution that can bridge the gap between applicants and employers using data-driven technologies.

Problem Statement

Current recruitment processes lack personalization, automation, and intelligent profile enhancement. Job seekers often submit non-ATS-friendly resumes, face difficulty matching their profiles to suitable roles, and receive little feedback on their online presence. At the same time, recruiters are burdened by manual screening processes, leading to inefficiencies and potential mismatches. There is a need for an integrated platform that provides real-time job matching, resume optimization, and intelligent assessment to improve outcomes for both parties.

Objectives:

The Resume Optimizer and Job Recommendation System aims to:

Provide a centralized platform for job seekers to create ATS-compliant resumes and manage their professional profiles. Integrate AI-powered modules including resume builders, profile scanners, and skill assessment tools to enhance candidate visibility.

Offer real-time job recommendations using AI and NLP-based matching algorithms tailored to individual skills and preferences.

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Assist recruiters by automating resume screening and improving access to high-quality, relevant candidate profiles

II. LITERATURE SURVEY

Resume Parsing: P. A. Srivastava et al. (2020) explore the use of Natural Language Processing (NLP) in resume parsing. Their research emphasizes how NLP can be applied to automatically extract relevant details such as skills, education, and experience from resumes, thereby streamlining the data input process in recruitment systems.Page Layout

AI-Based Job Matching: M. Patel and R. Gupta (2021) highlight the effectiveness of AI-driven job matching systems in aligning user profiles with job postings. The study demonstrates that machine learning algorithms can significantly enhance the precision of job recommendations based on candidate qualifications and job requirements.

Resume Optimization for ATS:D. Kumar and S. Bose (2022) discuss how optimizing resumes with job-specific keywords improves candidate visibility in Applicant Tracking Systems (ATS). Their findings show that keyword-focused resume enhancement increases the chances of shortlisting and better aligns resumes with recruiter expectations. **NLP for Unstructured Data Parsing:** K. Singh and M. Desa (2023) focus on the role of NLP in transforming unstructured resume data into structured formats compatible with ATS. The study demonstrates how keyword extraction and information categorization help improve resume readability and machine parsing accuracy.

Deep Learning for Job Matching: A. Singh, G. Kumar, V. Kumar, and T. Mahesh (2023) present an overview of using deep learning techniques for job recommendation. They illustrate how advanced neural network models can map job requirements with user profiles, resulting in highly accurate and scalable job-candidate matches.

III. METHODOLOGY

The **Resume Optimizer and Job Recommendation System** integrates advanced artificial intelligence (AI) technologies to streamline the job search process and improve the overall job application experience. The system is designed with a multi-layered approach that enhances both resume optimization and job recommendations, ensuring a seamless and efficient interaction for both job seekers and recruiters. The core components of the methodology are outlined below:

User Registration and Platform Access Users begin by registering on the platform, which provides access to essential features including resume upload, job recommendations, and application tracking. The registration process is simple, enabling users to easily start optimizing their resumes and exploring job opportunities.

Resume Analyzer with ATS Score and Recommendations: As part of the **Resume Analyzer** feature, users will receive a comprehensive review of their uploaded resume along with an **ATS compatibility score**. This score reflects how well the resume aligns with ATS requirements based on keyword usage, formatting, and industry standards. Additionally, the system will suggest areas for improvement to enhance the resume's ATS score and overall quality. The Resume Analyzer will also recommend **online courses** or certifications related to the user's field, skills, and qualifications. These course recommendations aim to further strengthen the user's resume by filling skill gaps or providing additional expertise that employers may be looking for.

Job Recommendation: The system employs a machine learning-based recommendation engine to suggest job opportunities that align with the user's profile, preferences, and job search behavior. Factors considered include:

- Skills
- Job history and preferences
- Location
- Industry

The recommendation engine refines its suggestions over time, learning from the user's application history and engagement with job postings to provide increasingly relevant opportunities.

Application Tracking and Notifications: The platform integrates an **application tracking feature**, allowing users to monitor the status of their job applications in real-time. The tracking system provides notifications at key milestones, such as:

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Interview scheduling Application review status Feedback from employers These updates are sent via email or SMS, ensuring users stay informed and can act quickly as their job applications progress. **Dashboard and User Experience**: The platform provides an intuitive **dashboard** where users can: Track the status of multiple job applications View recommended job listings Access personalized resume optimization tips This user-friendly interface helps users stay organized and efficiently manage their job search process. **Tools and Technologies: Frontend:** -Language: TypeScript -Framework/Library: React -Styling: Tailwind CSS -State Management: Redux Toolkit -Bundler: Vite **Backend:** -Language: Java -Framework: Spring Boot -Authentication: JWT (JSON Web Token) -File Handling: MultipartFile API for Resume Upload -E-mail Service: JavaMailSender (Spring Boot) **AI/ML Integration:** -Language: Python -Libraries: NLTK, Scikit-learn, pandas -Model Purpose: Skill extraction, job matching **Database:** -Engine: MongoDB **Resume Parsing:** -Library: Python-based custom parser using PyMuPDF (fitz) / spaCy **APIs & Integration:** -Resume Upload & Analysis API: REST endpoints (Spring Boot) -Job Matching API: Flask or FastAPI for ML model serving

IV. SYSTEM IMPLEMENTATION

The **Resume Optimizer and Job Recommendation System** is implemented using a modular, scalable architecture that integrates a web application with AI-powered backend services for resume parsing, job matching, and real-time user feedback. The following technologies and components were used for system development:

Frontend Development: The user interface is developed using React with TypeScript, styled with Tailwind CSS, and bundled using Vite for fast builds and optimal performance. The frontend enables users to:

Register and log in securely using JWT authentication.

Upload resumes for parsing and receive real-time optimization feedback.

View personalized job recommendations and apply for jobs directly through the platform.

Track the status of job applications via a user-friendly dashboard.

Backend Development: The backend is built using **Java** with the **Spring Boot** framework, following a **RESTful API architecture**. Key backend functionalities include:

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User authentication and session management using JWT. Resume upload and file handling via the MultipartFile API.

Email notifications (e.g., application confirmations, feedback alerts) handled through JavaMailSender.

Resume analysis requests routed to AI services for processing and scoring.

A separate Flask or FastAPI server is integrated to handle the recommendation engine and resume analyzer, providing:

Skill extraction from resumes.

Job matching based on extracted skills and job description similarity.

ATS compatibility scoring and course recommendations for resume improvement.

Database Management: Data is stored using MongoDB, a NoSQL document-oriented database that supports flexible and scalable data modeling. The system stores information in collections such as:

- Users •
- Resumes •
- Job Listings
- Applications
- Recommendations

MongoDB's schema-less structure allows the system to adapt easily to changing data formats (e.g., varied resume structures) and supports efficient querying for real-time recommendations and application tracking. Integration with the backend is managed using Spring Boot's Spring Data MongoDB module.

Resume Parsing and AI/ML Integration: The system uses a Python-based custom parser for extracting data from uploaded resumes. Key technologies include:

PyMuPDF (fitz) for PDF text extraction.

spaCy for Named Entity Recognition (NER).

NLTK and Scikit-learn for skill classification and job description comparison.

Parsed data is analyzed to provide an **ATS compatibility score** and actionable resume improvement suggestions.

APIs and Integration:

Spring Boot handles REST endpoints for resume upload, user management, and application tracking.

Flask/FastAPI serves the AI models for real-time resume analysis and job recommendation.

This modular microservice-based integration enables scalable, asynchronous communication between core components.

Notification and Media Management:

JavaMailSender is used to send email notifications such as job alerts and resume feedback.

Dotenv securely manages environment variables and sensitive credentials.

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Dotenv securely manages environment variables and sensitive credentials

V. RESULT

- System Performance: The Resume Optimizer and Job Recommendation System successfully integrated resume parsing, real-time feedback, job recommendation, and application tracking functionalities. The system consistently delivered accurate resume analysis and job matching under normal usage. Minor latency was observed during concurrent resume uploads and analysis, primarily due to high model computation loads.
- Scalability: The system efficiently handled a moderate volume of users and concurrent operations. However, further optimization-particularly in ML model serving and API response times-is required to scale effectively for high-traffic environments, especially during peak job search periods.

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System Overview:



Fig. 1 Home Page (Landing Page)



Fig. 2.User Registration Page



Fig. 3. Login Page

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Fig. 4User Profile



Fig. 5. Upload Resume for Analyzation

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Fig.6. Resume Result with Recommendations

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Fig.7. Resume related tips for optimization and courses

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Fig.8. Skill-Based available candidates for recruiter

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Fig.9. Listing or posting new opening for jobs

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Fig.10. Listed jobs on portal

VI. CONCLUSION

The Resume Optimizer and Job Recommendation System effectively streamlines the job application process by integrating AI-powered resume analysis, personalized job matching, and real-time feedback into a unified platform. It enhances the user experience through ATS compatibility scoring, skill-based recommendations, and a modern, intuitive interface. While the system performs efficiently under standard conditions, minor delays in model processing and notification delivery were observed during peak usage. Nevertheless, the platform demonstrates strong potential to improve job search outcomes and recruiter efficiency through intelligent automation and data-driven insights.

Future improvements will focus on optimizing AI model response times, enhancing scalability for higher user traffic, and expanding feature sets such as resume versioning and recruiter-side analytics tools.

REFERENCES

[1]. P. A. Srivastava, A. R. Sharma, and V. Kumar, "Resume Parsing Using Natural Language Processing," 2020 International Conference on Artificial Intelligence and Data Science (AIDAS), Bangalore, India, 2020.

[2]. M. Patel, R. Gupta, "AI-Driven Job Matching System," 2021 International Conference on Machine Learning and Applications (ICMLA), Mumbai, India, 2021.

[3]. D. Kumar, S. Bose, "Enhancing Recruitment Platforms with Resume Optimization," 2022 International Conference on Human Resource Technologies (ICHRTech), Chennai, India, 2022, pp. 102-105.

[4]. K. Singh, M. Desa, "Natural Language Processing for Resume Parsing," 2023 International Conference on Computational Linguistics (ICCL), Hyderabad, India, 2023.

[5]. Singh, G. Kumar, V. Kumar, T. Mahesh, "Job Matching with Deep Learning Techniques," Journal of Artificial Intelligence Research, vol. 8, no. 4, pp. 112-118, 2023.

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