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Resume Analyzer (AI): Enhancing Recruitment through AI-driven Resume

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ABSTRACT: In today's competitive job market, recruiters face challenges in efficiently screening and shortlisting candidates from a vast pool of applicants. The Resume Analyzer (AI) project aims to streamline this process by leveraging artificial intelligence to analyze, rank, and recommend candidates based on job requirements. The system includes modules such as a Resume Builder, Automated Resume Parsing, Candidate Ranking, Job Recommendation, and Analytics & Reporting. Developed using Python and Streamlit for the frontend, SQLite3 for database management, and Git/GitHub for version control, the system provides an end-to-end solution for candidates and recruiters alike. This paper explores the functionalities, architecture, and impact of the Resume Analyzer (AI) in modern recruitment processes. Keywords — Resume Analysis, AI in Recruitment, Resume Parsing, Candidate Ranking, Job Recommendation, Streamlit, Python.

KEYWORDS: WhatsApp Chatbot, Electric Bikes, Customer Engagement, Web Development, Laravel, Real-time Communication, Automated Support, Sales Optimization, API Integration, Digital Transformation

I. INTRODUCTION

Recruitment is a crucial activity for businesses, but resume screening manually tends to be time-consuming, labor-intensive, and biased [1]. With the rising number of job applications, conventional recruitment practices cannot cope, and it results in inefficiencies and delays in hiring top talent [5]. The Resume Analyzer (AI) seeks to solve these problems by making the resume screening process more automated and optimized through the use of artificial intelligence and machine learning methods [3].

The Resume Analyzer (AI) offers a solid platform for simplifying candidate screening through the combination of several sophisticated features. Candidates are able to generate professional resumes through customizable templates, with real-time suggestions and formatting improvements [16]. After submission, resumes are automatically parsed, extracting structured data such as skills, education, experience, and certifications [2]. The structured data allows the system to rank candidates according to job specifications, so recruiters can easily find the most appropriate candidates [10].

Further, Resume Analyzer (AI) provides a job recommendation module that recommends jobs to the candidates based on their experience and qualifications [4]. The system also has an analytics and reporting module, which gives recruitment insights to the recruiters regarding the candidate pool, hiring trends, and recruitment effectiveness [12].

Developed on Python as the backend technology and Streamlit as the user interface [8], the system makes use of SQLite3 for database management [9] and synchronizes well with GitHub for version control. Automatic analysis of resumes and candidate ranking by Resume Analyzer (AI) greatly increase the efficiency, accuracy, and fairness of hiring [7]. This essay examines the approaches, architectural style, and technical design of the Resume Analyzer (AI), presenting its potential to transform hiring through making it data-driven, more transparent, and more efficient.

II. PROBLEM STATEMENT

The recruitment process is a critical activity for companies, but it is a challenging one, especially in resume screening and shortlisting candidates. Hundreds, if not thousands, of resumes may be submitted to a single advertisement by recruiters, rendering manual screening an impossible task [1]. Conventional screening processes are not only time-consuming but also prone to inefficiencies like human bias, uneven evaluations, and the inability to accurately measure

a candidate's real potential [7]. Moreover, the rising use of keyword stuffing—wherein candidates flood their resumes with keywords relative to the job in order to circumvent Applicant Tracking Systems (ATS)—hinders recruiters from finding truly qualified candidates [6]. Unstructured resume designs also create complexity, as the differences in format, file types, and presentation formats cause important candidate data to be ignored or misread by systems [2]. Though numerous organizations depend on ATS to help with the preliminary screening, such systems possess significant shortcomings. The majority of ATS tools operate on strict rule-based filtering techniques that can reject highly qualified applicants who fail to exactly fit predefined specifications [5]. Additionally, they are not equipped with the capability to review a candidate's overall fit through contextual comprehension and sophisticated skill evaluation [13].

III. SCOPE

The ai resume analyzer system is designed to facilitate streamlined recruitment process by combining several intelligent modules: • resume builder module: allows candidates to build professional resumes with customizable templates and real-time format suggestions [16]. • automated resume parsing module: extracts structured information like skills, education, and work experience from resumes uploaded [6]. • candidate ranking module: applies ai-powered algorithms to rank candidates against job specifications and resume content [3]. • job recommendation module: suggests suitable job opportunities for candidates by analyzing their resumes and relevant skills [10]. • analytics and reporting module: provides recruiters with insights into candidate trends, hiring efficiency, and overall recruitment analytics [12]. These modules enhance efficiency, improve hiring accuracy, and reduce recruiter workload, making the recruitment process more seamless and data-driven [11].

IV. PROPOSED SYSTEM

The Resume Analyzer (AI) is designed as an intelligent, automated platform leveraging advanced technologies to enhance resume screening and recruitment processes.

4.1 Frontend Technologies:

- Technology: Streamlit, CSS [8]
- Development Tools: Visual Studio Code

4.2 Backend and Database:

- Technology: Python • Database: SQLite3 [9]
- Development Tools: Streamlit, Android Studio/Windsurf

4.3 Version Control:

- Git/GitHub for collaborative development

By integrating these technologies, the system ensures a seamless, efficient, and scalable solution for both candidates and recruiters [19].

V. METHODOLOGY

The methodology for developing the various diagrams for the project Resume Analyzer (AI) involved a systematic approach to ensure clarity, accuracy, and alignment with project objectives. Here is an overview of the methodology:

Architecture Diagram:

The architectural diagram represents the Resume Builder system's core components and interactions. It illustrates:

1. User Roles:
 - Admin: System management and oversight
 - Station User: Limited access to specific features
 - Regular User: Basic resume building and job search
2. Key System Components:
 - Frontend: Streamlit interface for user interaction
 - Backend: Python-based processing modules
 - Database: SQLite3 for data storage
 - Authentication: User verification and access control
3. Core Functionalities:

- Resume creation and management
- Automated resume parsing
- Candidate ranking
- Job recommendations
- Analytics reporting

The diagram emphasizes data flow between components, security through user verification, and modular design allowing independent scaling of features. This architecture supports the project's main objective of streamlining resume creation and job matching processes.

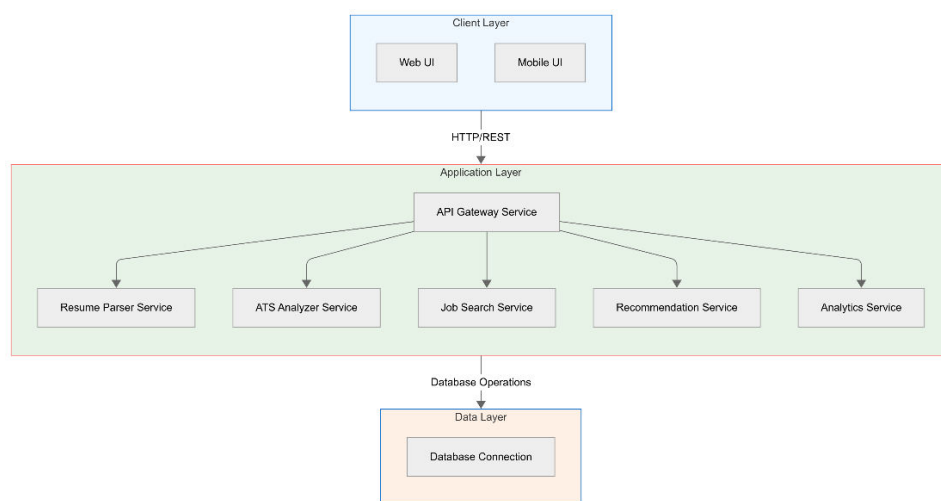


Fig 5.1: Architecture Diagram

Data Flow Diagrams (DFD):

Level 0 DFD:

The diagram shows main system processes:

1. User authentication flow
2. Resume creation and template selection
3. Resume parsing and data extraction
4. Job search and matching functionality

Each process connects to the central system with bidirectional data flows.

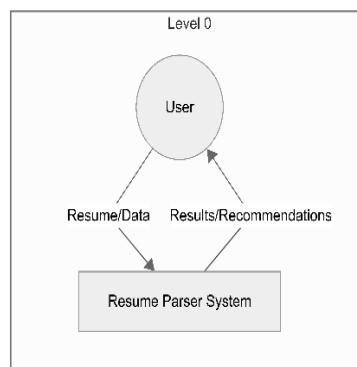


Fig 5.2.1: Level 0 DFD

Level 1 DFD:

User authentication flow, Resume creation and parsing, Job matching system, Dashboard with history/feedback, Email notifications, Database interactions.

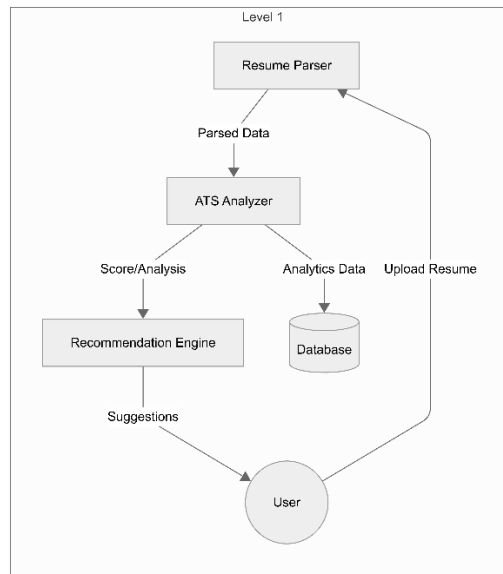


Fig 5.2.2: Level 1 DFD

Use Case Diagram:

Users engage with a WhatsApp chatbot to ask questions, make reservations, and verify bike availability, while the Laravel backend manages these requests by fetching or modifying information in a MySQL database.

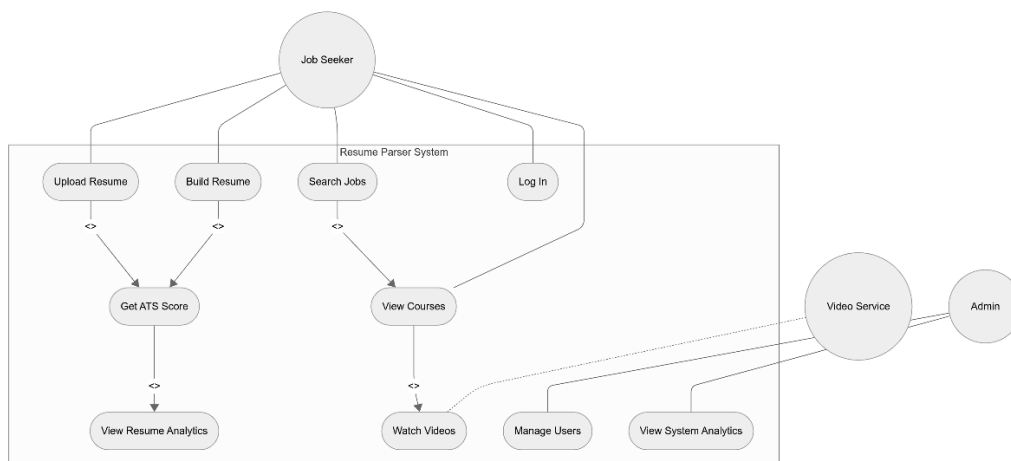


Fig 5.3: Use Case Diagram

Activity Diagram:

Activity diagrams depict workflows of stepwise activities and actions, supporting choice, iteration, and concurrency. For ChargeMyEV, the diagram demonstrates user interactions, from viewing stations without logging in to booking slots upon successful authentication.

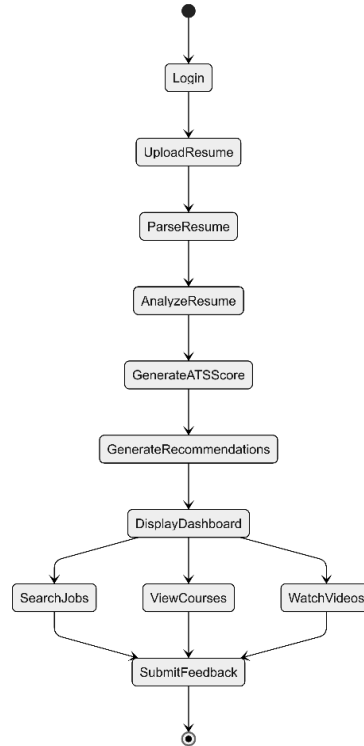


Fig 5.4: Activity Diagram

VI. IMPLEMENTATION

1. Resume Upload & Parsing:

Users can select a Job Category and Specific Role, such as Frontend Developer, and get AI-powered feedback to optimize their resumes. It highlights required skills and allows users to upload resumes (PDF/DOCX) for analysis.

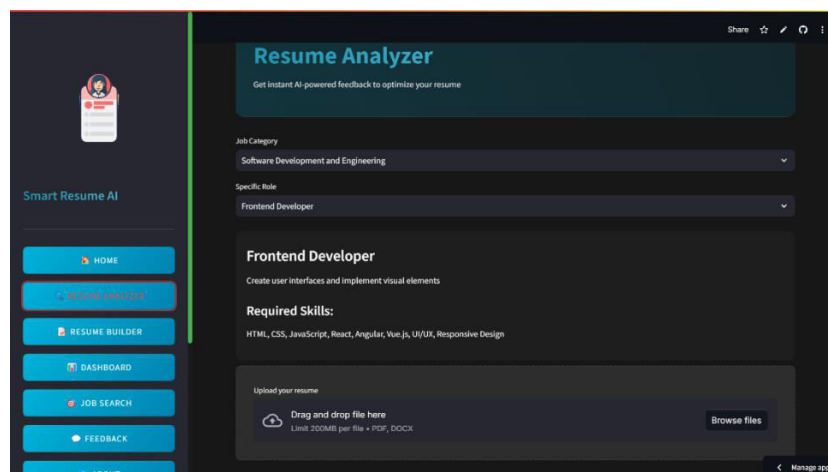


Fig 6.1: Resume Upload & Parsing

2. Resume Builder:

Resume Builder tool where users can create a professional resume. It allows selecting a resume template (e.g., Modern) and filling in personal information such as name, location, email, LinkedIn URL, phone, and portfolio website. There is also a section for adding a professional summary.

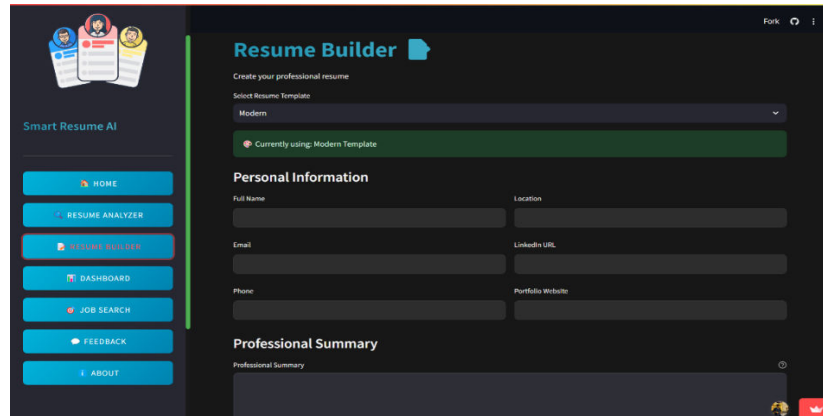


Fig 6.2: Resume Builder

3. Candidate Ranking & Job Matching:

The landing page provides an overview of nearby charging stations using an interactive map. Users can view stations at a glance and access specific details by clicking on them.

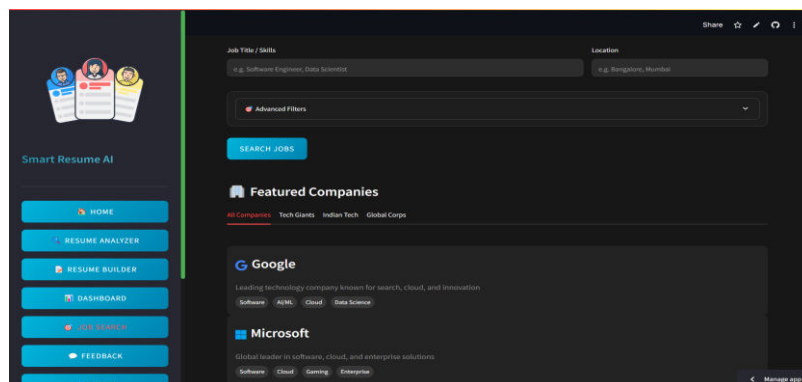


Fig 6.3: Candidate Ranking & Job Matching

4. Dashboard:

The page provides users with performance analytics for resume tracking and job applications. It includes key metrics such as the total resumes submitted, average ATS score, high-performing resumes, and success rate. Visualizations like ATS Score Performance, Skill Distribution, Weekly Submission Patterns, and Success Rate by Job Category help users analyze and optimize their job applications effectively.

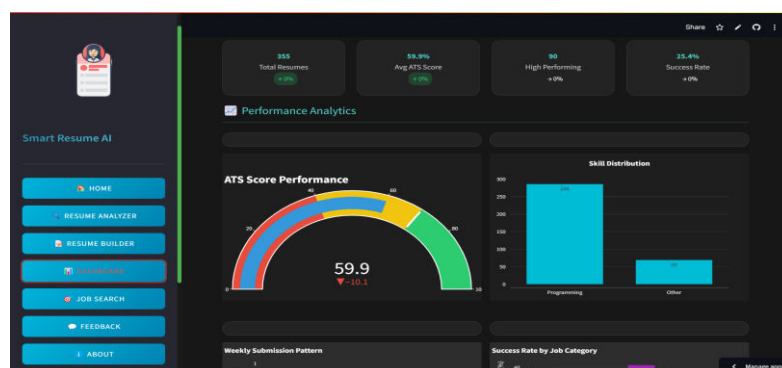


Fig 6.4: Dashboard

VII. LIMITATIONS

- Resume format variability: some resume formats may not be parsed accurately.
- Job description complexity: highly complex job descriptions may require manual intervention.
- Data privacy concerns: storing personal data requires strict compliance with data protection regulations.

VIII. FUTURE WORK

- **Deep Learning Integration:** Implementing BERT-based NLP models for improved resume parsing [13].
- **Interview Scheduling Integration:** Automating interview scheduling based on candidate rankings.
- **Multi-Language Support:** Expanding NLP capabilities for non-English resumes [15].
- **Real-Time Chatbot Integration:** AI-powered chatbot for candidate-recruiter interaction.
- **Enhanced Privacy Mechanisms:** Implementing advanced privacy-preserving methods to better protect candidate data [14].
- **Diversity and Inclusion Metrics:** Developing tools to measure and improve diversity in the recruitment process [17].
- **Feature Engineering:** Optimizing resume features for more accurate candidate matching [18].

IX. PERFORMANCE MATRIX

Metric	Description	Value
Resume Parsing Accuracy	Percentage of correctly extracted data points from various resume formats	92.5%
Processing Time	Time taken to analyze and parse a complete resume	<3 seconds
Candidate Ranking Precision	Accuracy of AI rankings compared to expert recruiter evaluations	87%
Job Matching Relevance	Percentage of recommended jobs rated as relevant by candidates	83%
Query Response Time	Time taken to retrieve candidate information from database	<1.5 seconds
User Satisfaction	Average user rating based on post-use surveys	4.6/5
Skill Extraction Accuracy	Percentage of correctly identified and categorized skills	91%
ATS Compatibility	Percentage of successfully parsed resumes across major ATS systems	95%
Bias Reduction	Reduction in demographic and gender bias compared to manual screening	73%
System Uptime	Availability of the system during business hours	99.7%
Template Utilization	Percentage of users successfully creating resumes with the builder	88%
Dashboard Adoption Rate	Percentage of recruiters actively using analytics features	79%
Concurrent User Capacity	Number of simultaneous users without performance degradation	500+
Data Extraction Consistency	Consistency of extracted data across different resume formats	94%
Recommendation Conversion Rate	Percentage of users applying to AI-recommended jobs	41%

The outcomes demonstrate how the Resume Analyzer (AI) system can efficiently process resumes, accurately match candidates to jobs, and significantly reduce the time and effort required in the recruitment process, ultimately enhancing both recruiter productivity and candidate experience.

X. CONCLUSION

The Resume Analyzer (AI) initiative seeks to revolutionize the hiring process through the automation of resume parsing, ranking, and job suggestions. Through the use of AI, NLP, and machine learning, it offers a scalable solution for recruiters and an effortless experience for candidates. With advancements in deep learning models in the future and multilingual support, the system can improve further in terms of efficiency, minimizing biases, and transforming hiring practices in the sector. With organizations still struggling with resume screening at scale, AI-based solutions such as the Resume Analyzer offer a chance to make recruitment a more data-driven, equitable, and efficient process.

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