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ResuMatch: Resume Screening System Using AI

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Abstract: The rapid adoption of Applicant Tracking Systems (ATS) has transformed the recruitment process by automating the initial screening of resumes. Although these systems improve efficiency, they often reject qualified candidates due to poor keyword matching, improper formatting, and lack of alignment between resumes and job descriptions. This paper presents ResuMatch, an AI-based resume screening and enhancement system designed to assist job seekers in optimizing their resumes according to ATS and industry requirements. The proposed system uses Natural Language Processing techniques to analyze resumes and job descriptions, compute an ATS compatibility score, identify missing skills and keywords, and perform skill gap analysis. It further provides personalized recommendations, including suitable projects, relevant online courses, and alternative career paths, along with spelling and grammatical correction to improve resume quality. The integrated framework of ResuMatch offers a comprehensive solution for resume optimization and career guidance, helping candidates improve their chances of shortlisting in an increasingly competitive job market.

Index Terms - Resume Screening, Applicant Tracking System (ATS), Natural Language Processing (NLP), Skill Gap Analysis, Resume Optimization, Career Recommendation, Machine Learning.

I. INTRODUCTION

A resume is the fundamental core in the selection of the individuals for their dream job role. But they often get rejected because the resume is not fit for the particular job role. And we have faced the same problem. Sometimes the format is wrong, skills are not correct, projects are not up to the mark, we have not used the correct keywords, ATS score is low and so much more. And our project called “ResuMatch: Resume Screening System using AI” exactly helps in that. Worldwide, many students and employees can use our project in enhancing their resumes for better opportunities in their careers.

The system analyzes a candidate’s resume and compares it with a given job description to evaluate compatibility. It provides personalized recommendations such as missing skills, important keywords, suitable project ideas, and relevant online courses for skill enhancement. In addition, the system suggests alternative career paths based on the user’s existing skill set, identifies spelling and grammatical errors, and computes an ATS compatibility score to indicate how well the resume matches the target role.

The main objective of ResuMatch is to assist job seekers in improving their resumes in a structured and data-driven manner, thereby increasing their chances of passing ATS screening and securing interview opportunities. By combining natural language processing and machine learning techniques, the proposed system acts as an intelligent career support tool that bridges the gap between academic learning and industry requirements.

II. MOTIVATION

The increasing use of Applicant Tracking Systems (ATS) in recruitment has made resume screening highly automated and keyword-driven. Many deserving candidates fail to get shortlisted not due to lack of skills, but because their resumes are not optimized according to job descriptions and ATS standards. This creates a need for an intelligent system that can guide users in improving their resumes by identifying missing skills, relevant keywords, suitable projects, and learning resources. The motivation behind ResuMatch is to help job seekers understand and overcome these limitations by providing personalized, AI-driven feedback that enhances resume quality and improves job matching and career opportunities.

III. PROBLEM STATEMENT

With the widespread adoption of Applicant Tracking Systems (ATS), resume screening has become largely automated and dependent on keyword matching and content relevance. Many candidates, especially students and fresh graduates, are unaware of how their resumes are evaluated by these systems. As a result, resumes with relevant skills and experience are often rejected due to missing keywords, improper formatting, grammatical errors, or weak alignment with the job description. In addition, job seekers often lack proper guidance on which skills to develop, which projects to undertake, and which career paths best match their current abilities. Therefore, there is a need for an intelligent and user-friendly system that can analyze resumes, compare them with job requirements, and provide personalized recommendations to improve employability and ATS compatibility.

IV. OBJECTIVES

- To analyse resumes and job descriptions using natural language processing and compute an ATS compatibility score.
- To identify missing and relevant skills, keywords, and projects, and recommend suitable courses for improvement.
- To suggest appropriate career paths and correct spelling and grammatical errors to enhance overall resume quality.

V. SCOPE OF PROJECT

The scope of the ResuMatch system is focused on assisting students, fresh graduates, and job seekers in improving their resumes according to industry and Applicant Tracking System (ATS) requirements. The system performs resume–job description matching to calculate an ATS compatibility score and provides recommendations for missing skills, important keywords, suitable projects, and relevant online courses. It also supports basic language correction by identifying spelling and grammatical errors. Furthermore, the system suggests alternative career paths based on the user's existing skill set. The study is limited to textual analysis of resumes and does not include evaluation of candidate performance in interviews or real-time recruiter feedback.

VI. LITERATURE SURVEY

The application of Artificial Intelligence (AI) and Natural Language Processing (NLP) in recruitment has gained significant attention due to the increasing use of Applicant Tracking Systems (ATS).

According to Javed et al. [1], ATS primarily rely on keyword matching and similarity measures to filter resumes, which often leads to the rejection of qualified candidates if their resumes are not optimized for machine screening Research by Singh and Kumar [2] focused on resume parsing using NLP techniques to extract structured information such as skills, education, and experience. Their study showed that accurate information extraction is essential for effective job–candidate matching.

Similarly, Zhao et al. [3] used TF-IDF and cosine similarity to compute the relevance between resumes and job descriptions, demonstrating that text similarity methods can be effectively applied for automated screening.

Several studies have also explored recommendation systems for career guidance. Patel et al. [4] proposed a skill-based career recommendation framework that suggests suitable job roles based on the user's current

competencies. Another work by Brown and Wilson [5] highlighted the importance of identifying skill gaps and recommending online learning resources to improve employability.

Grammar and spelling correction in professional documents has been studied by Lee et al. [6], who showed that language correction tools can significantly improve resume quality and recruiter perception. However, most existing systems address only individual components such as resume parsing, skill matching, or course recommendation.

The proposed ResuMatch system integrates these aspects into a single platform by combining ATS scoring, skill and keyword extraction, project and course recommendation, career path suggestion, and language correction. This holistic approach extends previous research and provides a more comprehensive solution for resume optimization and career support.

Furthermore, recent studies have explored the use of deep learning models such as BERT and word embeddings for semantic understanding of resumes and job descriptions. These models improve matching accuracy by capturing contextual meaning rather than relying only on exact keyword matches. Research indicates that such context-aware systems provide better skill gap analysis and more relevant job recommendations, which supports the design of intelligent, AI-driven resume screening systems like ResuMatch.

VII. PROPOSED SYSTEM

The architecture of ResuMatch is designed to integrate multiple modules that enable efficient processing of resumes and generation of intelligent recommendations. The key modules and their functionalities are described below:

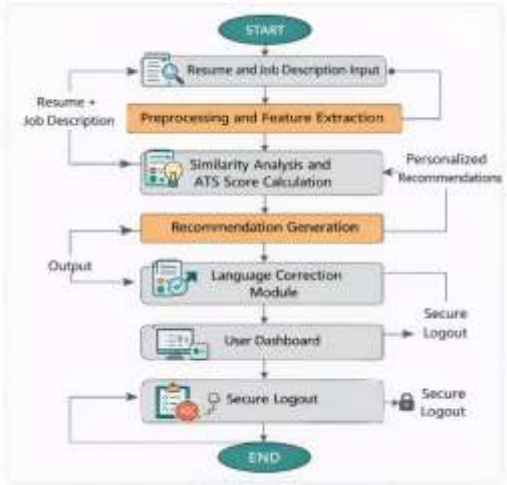

Fig 1: System Architecture

The architecture of ResuMatch: Resume Screening System using AI is designed to seamlessly integrate various components and enable efficient data flow throughout the system. The key modules and their functionalities are as follows:

- **Start:** The process begins when the user accesses the ResuMatch platform.

- **SignUp:** New users are required to register by providing basic details. This step creates a user account and enables personalized access to the system.

- **Login:** Registered users log in using valid credentials. This ensures secure authentication and controlled access to the platform.

- **Main Homepage:** After successful login, the user is redirected to the main homepage, which serves as the central interface for accessing all features ResuMatch.

- **Resume and Job Description Input:** In this stage, the user provides the resume file and the corresponding job description. These inputs act as the primary data sources for analysis.

- **Preprocessing and Feature Extraction:** The system performs text preprocessing such as tokenization, stop-word removal, and normalization. Important features, including skills, keywords, education, and experience, are extracted from both the resume and the job description.

- **Recommendation Generation:** The Based on the identified gaps, the system suggests missing skills, important keywords, relevant project ideas, and suitable online courses. It also recommends alternative career roles aligned with the user's existing skill set.

- **User's Dashboard:** The dashboard displays the ATS score, skill gap analysis, recommendations, and career suggestions in an organized manner, allowing the user to track improvements.

- **Logout:** The system provides an option to log out. If the user selects Yes, the session is terminated securely. If no, the user is redirected back to the main homepage to continue using the system.

- **End:** The process ends when the user logs out of the system.

VIII. METHODOLOGY

The proposed ResuMatch system analyzes a user's resume and a target job description using Natural Language Processing techniques. The input text is first preprocessed through tokenization, cleaning, and normalization. Key features such as skills and keywords are then extracted and represented using vector models. A similarity measure is applied to compute an ATS compatibility score and identify missing skills. Based on this analysis, the system generates recommendations for skills, projects, courses, and career paths, and also performs basic spelling and grammar correction. The final results are presented to the user through an interactive dashboard.

In addition, the system follows a modular design where each component performs a specific function, such as resume parsing, similarity computation, recommendation generation, and language correction. This modular approach improves scalability and allows future integration of advanced deep learning models for more accurate semantic matching and personalized career guidance.

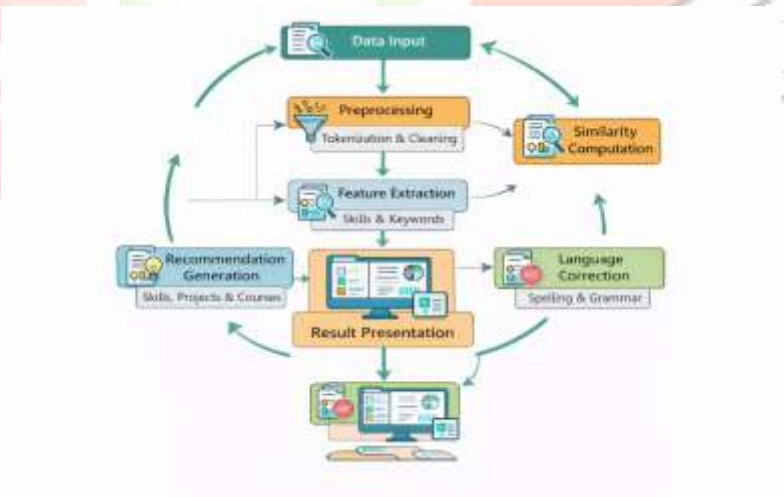

Fig 2. Workflow of ResuMatch

Figure 3 illustrates the complete methodological workflow of the ResuMatch system. The process begins with the input of the user's resume and the target job description. These documents are first passed through a data preprocessing stage where irrelevant elements such as stop words, punctuation, and noise are removed, and the text is normalized for further analysis.

Next, the feature extraction module identifies important components such as technical skills, educational qualifications, and work experience. The extracted information is transformed into vector representations to enable mathematical comparison. A similarity analysis is then performed using techniques like TF-IDF and cosine similarity to compute the ATS compatibility score and to detect skill gaps between the resume and the job description.

Based on this analysis, the recommendation generation module suggests missing skills, relevant project ideas, suitable online courses, and alternative career paths. Simultaneously, the feedback and language correction module checks for spelling and grammatical errors and refines the resume content. Finally, all results, including the ATS score, skill gap report, and recommendations, are displayed on the user dashboard, completing the methodology workflow.

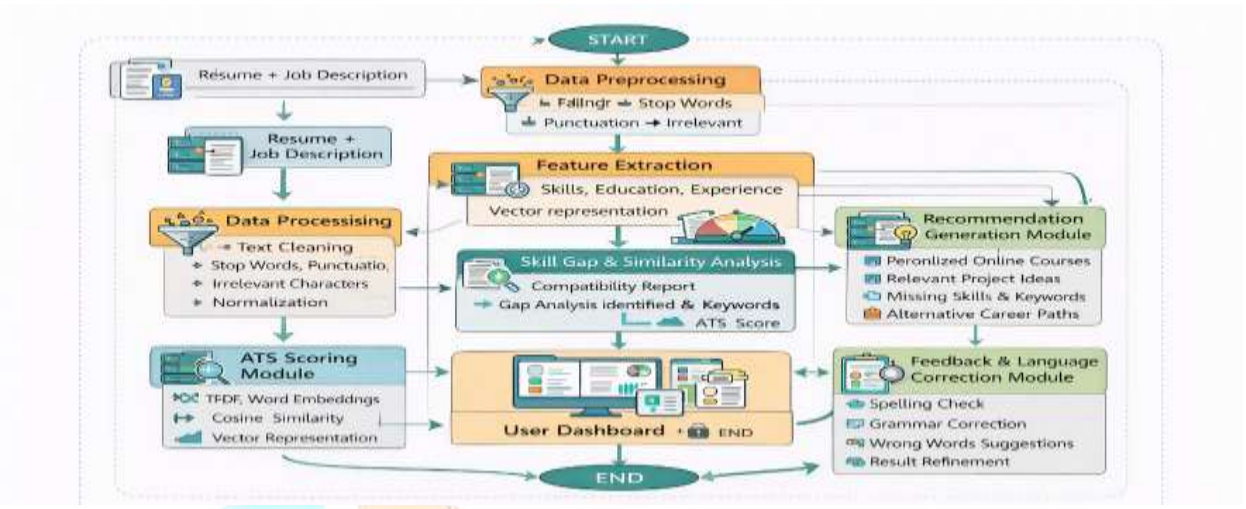

Fig 3. Methodology of ResuMatch

The detailed system architecture and internal working of the ResuMatch platform can be seen in figure 4. The process starts from the user interface in a web browser, where the resume and job description are uploaded. These inputs are forwarded to the resume parsing module, which extracts structured information from unstructured text.

The preprocessing and processing modules perform tokenization, stop-word removal, lemmatization, and text cleaning. The skill and keyword extraction module then identifies core competencies, educational details, and experience-related terms. These features are converted into numerical vectors using vectorization techniques such as TF-IDF and word embeddings.

The similarity computation module calculates the semantic similarity between the resume and job description and generates an optimized ATS score while also identifying missing or weak skill areas. Based on this output, the recommendation module proposes suitable courses, certifications, project ideas, and alternative career roles. In parallel, the language correction module performs spelling and grammar checking to improve resume quality.

Finally, the result presentation layer displays the ATS score, skill gap analysis, and personalized recommendations on the user dashboard, after which the user can securely log out. This figure clearly shows how different modules interact to form an integrated, end-to-end AI-based resume screening and enhancement system.

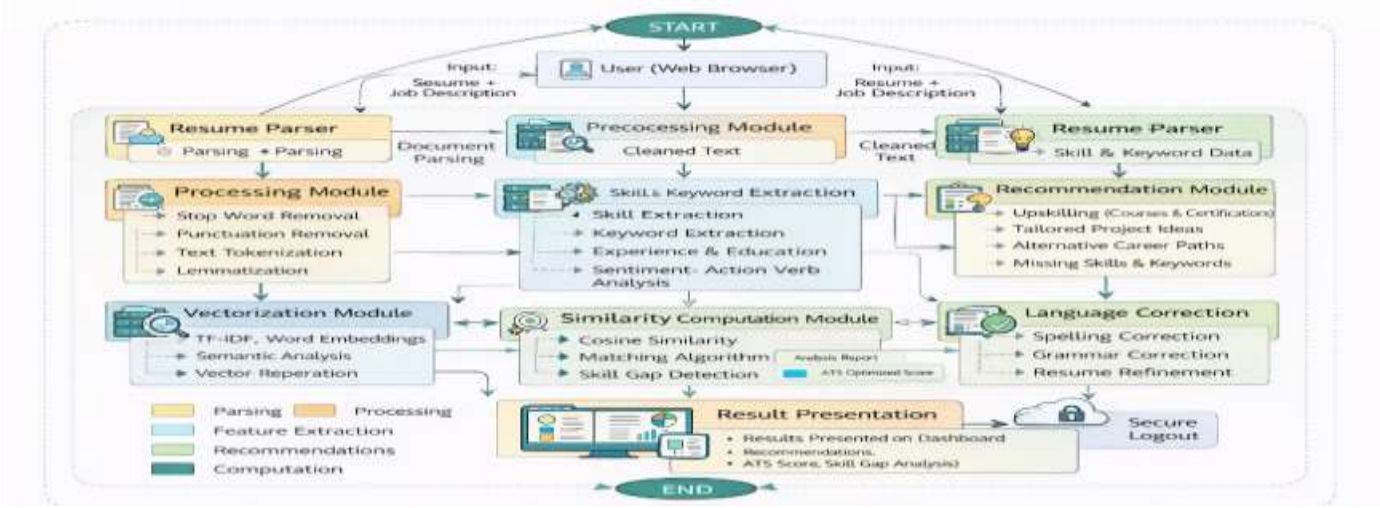

Fig 4. System Architecture of ResuMatch

IX. IMPLEMENTATION & RESULT

The ResuMatch system was implemented as a web-based application using a combination of Natural Language Processing and machine learning techniques. The front-end interface was developed to allow users to upload their resumes and enter the target job description in a simple and interactive manner. The backend was built using Python, where libraries such as NLTK, spaCy, and scikit-learn were used for text preprocessing, tokenization, stop-word removal, and feature extraction. TF-IDF and word embedding techniques were applied to convert textual data into numerical vectors, and cosine similarity was used to compute the matching score between the resume and job description, which was further mapped to an ATS compatibility score. A rule-based and similarity-driven approach was employed to identify missing skills and keywords, based on which recommendations for projects, courses, and alternative career paths were generated. Grammar and spelling correction was integrated using language processing tools to enhance resume quality. The entire system was deployed as a modular architecture, making it easy to extend and maintain, while ensuring fast response time and accurate analysis for real-time resume screening and optimization.

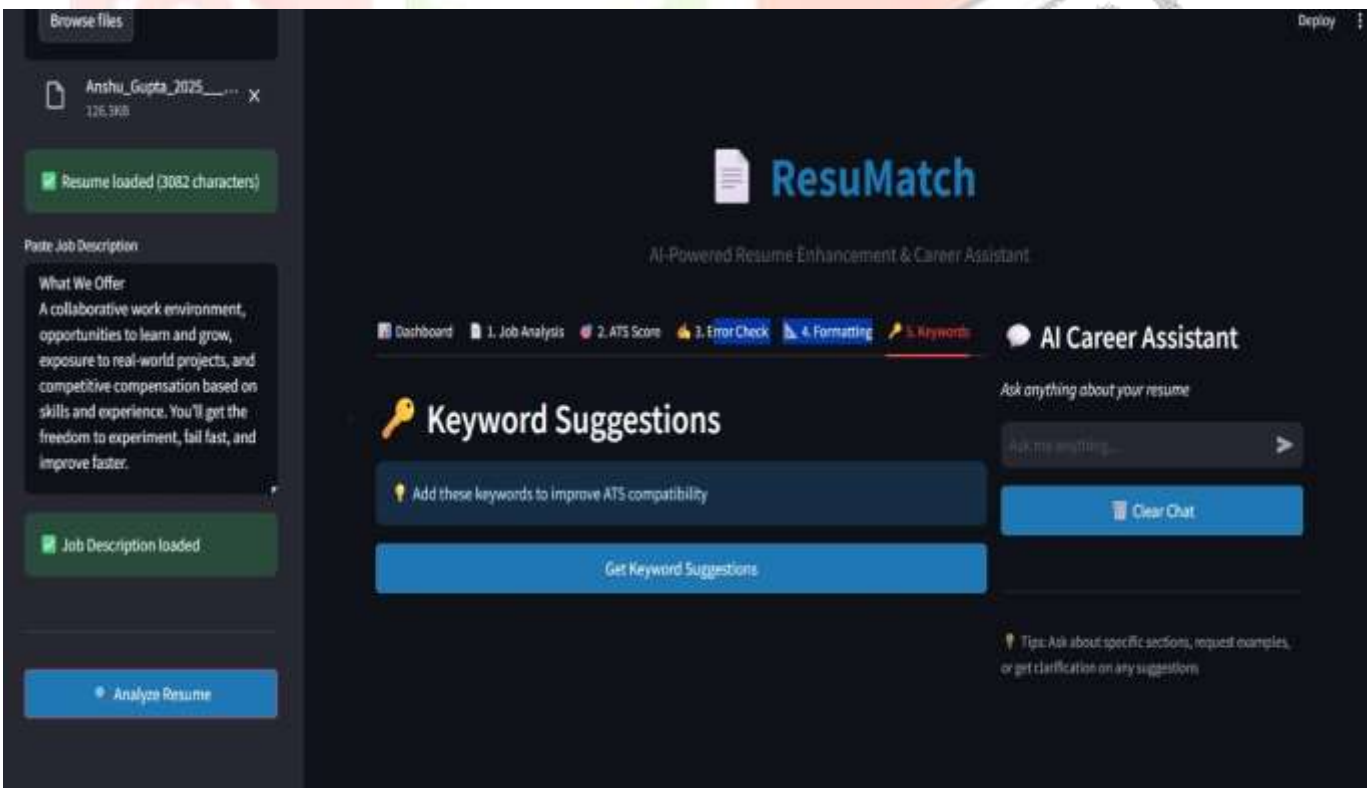

Fig 5. Dashboard

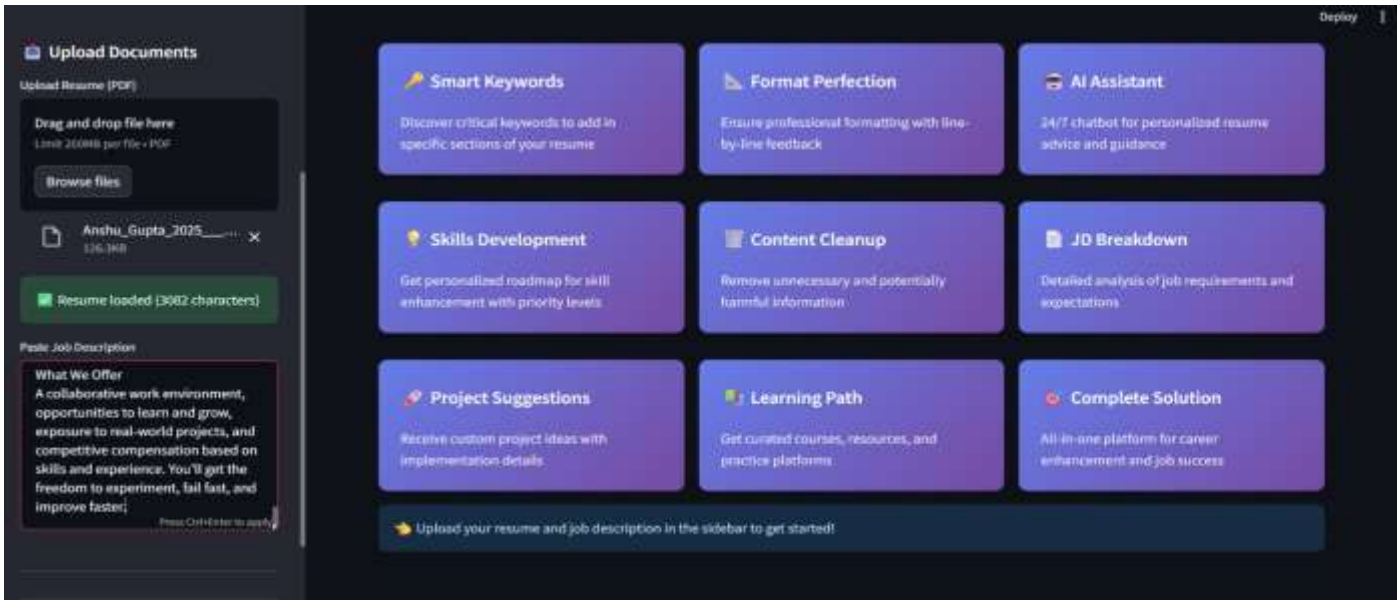

Fig 6. Features of ResuMatch

X. CONCLUSION

This work presented ResuMatch, an AI-based resume screening and enhancement system designed to assist job seekers in aligning their resumes with job descriptions and Applicant Tracking System (ATS) requirements. By applying Natural Language Processing techniques, the system analyzes resumes, computes an ATS compatibility score, identifies skill gaps, and provides personalized recommendations for skills, projects, courses, and suitable career paths. It also improves resume quality through spelling and grammatical correction. The proposed system offers a comprehensive and intelligent solution that bridges the gap between candidate profiles and industry expectations. ResuMatch not only supports candidates in optimizing their resumes for automated screening but also guides them toward continuous skill development and informed career planning. The integration of resume analysis, recommendation generation, and language correction within a single platform demonstrates the potential of AI-driven tools to enhance employability and streamline the recruitment preparation process. The modular architecture of ResuMatch allows easy scalability and future enhancements, such as the integration of advanced deep learning models for semantic understanding and real-time market analysis. The system can be extended to include recruiter feedback, interview preparation support, and continuous profile tracking, making it a comprehensive career development platform.

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