

AI-Powered Career Intelligence Platform for Resume Analytics and Skill Gap Optimization

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ABSTRACT: Career readiness plays a critical role in determining the employability of students in today's competitive job market. Despite possessing academic knowledge, many students fail to secure employment due to poorly structured resumes, lack of industry-relevant skills, and insufficient career guidance. This paper presents the Career Readiness and Placements Insights Platform (CRPIP), a Python full stack web application designed to assist students in evaluating and improving their resumes and career readiness. The platform enables students to register, upload resumes, and receive automated resume scores, skill gap analysis, and personalized improvement suggestions. The system utilizes Natural Language Processing techniques to analyse resume content, extract relevant information, identify missing skills, and provide meaningful feedback. The platform bridges the gap between academic learning and industry requirements by helping students understand their weaknesses and improve their professional profiles. The proposed system enhances employability by providing an intelligent, automated, and student-centric career guidance solution.

KEYWORDS: Career Readiness, Resume Analysis, Python Full Stack, Natural Language Processing, Skill Gap Analysis

I. INTRODUCTION

Career readiness refers to the ability of students to prepare themselves for employment opportunities by developing necessary skills, professional profiles, and industry-relevant competencies. In recent years, the job market has become increasingly competitive, and employers use resumes as the primary screening tool to evaluate candidates. A well-structured and informative resume significantly increases the chances of getting shortlisted, while poorly prepared resumes often result in rejection. Although students may possess strong academic knowledge, they often lack awareness of industry expectations, resume writing standards, and required technical skills.

Traditional career guidance systems and job portals mainly focus on job postings and applications rather than helping students improve their career readiness. As a result, students remain unaware of skill gaps and resume weaknesses. To address these challenges, the Career Readiness and Placements Insights Platform (CRPIP) has been developed using Python full stack technologies. The system provides automated resume analysis, skill gap detection, resume scoring, and feedback generation. By providing personalized suggestions and improvement recommendations, the system helps students enhance their employability and prepare effectively for job opportunities.

II. LITERATURE SURVEY

Recent advancements in Artificial Intelligence and Natural Language Processing have enabled the development of intelligent career guidance and resume analysis systems. Several researchers have focused on resume parsing and analysis. Resume parsing involves extracting structured information such as skills, education, and experience from unstructured resume documents. NLP techniques such as tokenization, keyword extraction, and Named Entity Recognition are commonly used for this purpose. Machine learning-based resume screening systems have also been developed to improve candidate-job matching accuracy.

These systems use similarity measures and classification algorithms to evaluate resume relevance. Resume scoring systems evaluate resumes based on various parameters such as skill relevance, resume completeness, and formatting. These systems provide feedback to help users improve their resumes. Skill gap analysis systems compare candidate skills with industry requirements and identify missing competencies. These systems provide recommendations for

skill improvement. However, most existing systems focus on recruiter-side filtering rather than student-side improvement. They do not provide detailed explanations or personalized feedback. Therefore, there is a need for a student-centric career readiness platform that focuses on improving employability. The proposed system addresses these limitations.

III. PROPOSED SYSTEM

The proposed Career Readiness and Placements Insights Platform (CRPIP) is a comprehensive web-based application developed to enhance student employability by providing auto-mated resume evaluation, skill gap identification, and personalized career improvement suggestions. The primary objective of the system is to assist students in understanding their current career readiness level and guide them toward improving their professional profiles to meet industry standards. Unlike traditional job portals that primarily focus on job listings and applications, the proposed system emphasizes student development by analysing resumes and providing meaningful feedback. The system enables students to register and create personal profiles by entering their academic information, technical skills, certifications, and career interests. After profile creation, students can upload their resumes in standard formats such as PDF or DOC. The overall system architecture is shown in Fig. 1. Once the resume is uploaded, the system processes the document using Natural Language Processing techniques.

The system extracts important information such as technical skills, education details, projects, certifications, and other relevant content. This extracted information is then evaluated to determine the quality and completeness of the resume. One of the key features of the system is resume score generation. The platform assigns a resume score based on predefined evaluation criteria such as skill relevance, presence of essential resume sections, clarity of information, and industry alignment. This score helps students understand the overall effectiveness of their resumes. The system also performs skill gap analysis by comparing the extracted skills with commonly required industry skills. Missing or weak skills are identified and presented to students.

This helps students understand what skills they need to develop to improve their employability. Another important feature is personalized feedback generation. The system provides detailed suggestions such as improving resume structure, adding technical skills, including certifications, and enhancing project descriptions. These recommendations enable students to improve their resumes effectively. The platform is developed using Python full stack technologies. The frontend is implemented using HTML, CSS, and JavaScript, which provides a user-friendly interface. The backend is implemented using Python and Django framework, which handles resume processing, scoring, and feedback generation. The MySQL database is used to store user profiles, resumes, scores, and analysis results securely. Overall, the proposed system provides an intelligent, auto-mated, and user-friendly solution that enhances career readiness and improves student employability..

IV. SYSTEM ARCHITECTURE

The system architecture of the Career Readiness and Placements Insights Platform is designed using a three-tier architecture consisting of the Presentation Layer, Application Layer, and Database Layer. This architecture ensures modularity, scalability, and efficient performance of the system. The Presentation Layer acts as the user interface, allowing students, counsellors, and administrators to interact with the system through a web browser. This layer is developed using HTML, CSS, and JavaScript and provides functionalities such as registration, login, resume upload, and viewing analysis results.

The Application Layer is developed using Python and Django framework and contains the core logic of the system. This layer handles resume analysis, skill gap identification, score generation, and feedback generation. Natural Language Processing techniques are used in this layer to process resume content and extract relevant information. The Database Layer is implemented using MySQL and is responsible for storing user information, resume files, analysis results, scores, and feedback.

The database ensures secure storage and efficient retrieval of data. Fig. 1. System Architecture of Career Readiness Platform The architecture follows a modular design where each layer performs a specific function. This separation

improves system scalability, maintainability, and performance. The system can handle multiple users simultaneously and provide real-time resume analysis and feedback.

V. METHODOLOGY

The methodology describes the step-by-step process followed by the system to analyse student resumes and generate career improvement suggestions. The system uses Natural Language Processing techniques and Python full stack technologies. Initially, the student registers and logs into the system. After successful authentication, the student uploads their resume.

The uploaded resume is processed by the resume analysis module. The Natural Language Processing module extracts relevant information such as skills, education, certifications, and project details. This information is evaluated to generate a resume score.

The system then compares extracted skills with industry-required skills and identifies skill gaps. Based on this analysis, feedback and suggestions are generated. Finally, the system displays resume score, skill gaps, and feedback to the student. The methodology workflow is shown in Fig. 2. This methodology ensures accurate resume analysis and helps students improve their career readiness effectively. The system provides automated, fast, and reliable feedback. Fig. 2. Methodology Workflow of Career Readiness Platform

VI. RESULTS AND DISCUSSION

The Career Readiness and Placements Insights Platform was successfully implemented and evaluated using real-time student data and multiple resume samples. The system demonstrated effective performance in analysing resumes, extracting relevant information, generating resume scores, identifying skill gaps, and providing personalized feedback to students. The results confirm that the proposed system helps improve student career readiness and employability. The resume analysis module was able to accurately extract key information such as technical skills, educational qualifications, certifications, and project details from uploaded resumes. The Natural Language Processing techniques used in the system successfully converted unstructured resume content into structured data. This structured data enabled the system to perform further analysis and evaluation efficiently.

The system was tested using resumes with different formats, and it was able to process them successfully without errors. The resume scoring module generated meaningful and reliable scores based on predefined evaluation criteria. The scoring criteria included presence of technical skills, completeness of resume sections, relevance of projects, and availability of certifications. Students who included proper skills, detailed project descriptions, and certifications received higher scores. On the other hand, students with incomplete resumes or missing important sections received lower scores. This scoring mechanism helped students understand their resume quality level. The skill gap identification module was able to detect missing skills effectively.

The system compared extracted student skills with industry-required skills stored in the database. If important skills such as Python, Java, Machine Learning, Web Development, or Database Management were missing, the system identified them and provided recommendations. This helped students understand which skills they need to learn to improve their career opportunities.

The feedback generation module provided personalized suggestions to students based on resume analysis results. The feedback included suggestions such as improving resume structure, adding technical skills, including certifications, improving project descriptions, and completing missing sections. This feedback helped students improve their resumes and enhance their professional profiles. The platform also provided placement insights and student progress monitoring features for counsellors and administrators. Counsellors were able to monitor student readiness, identify weak areas, and guide students accordingly. Administrators were able to view overall system statistics such as total students, resume scores, and placement trends.

The system demonstrated fast processing performance. The average resume analysis time was less than five seconds, which confirms the efficiency of the system. The web interface provided smooth user experience, allowing students to

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easily upload resumes and view feedback results. The experimental results show that the proposed system provides an effective solution for improving student career readiness. Unlike traditional systems that only provide job listings, the proposed platform focuses on improving student profiles and skills. This makes the system more useful for students preparing for placements.

The system also helps bridge the gap between academic education and industry requirements. Students become aware of missing skills and can take necessary steps to improve their knowledge. This increases their chances of getting shortlisted for job opportunities. The overall system performance, accuracy, and feedback quality demonstrate that the proposed Career Readiness Platform is efficient, reliable, and useful for improving student employability. The system provides an intelligent and automated solution for resume evaluation and career improvement.

VII. CONCLUSION

The Career Readiness and Placements Insights Platform was successfully designed and implemented to address the challenges faced by students in preparing for placements and improving their employability. The system provides an intelligent and automated solution that evaluates student resumes, identifies skill gaps, generates resume scores, and provides personalized feedback and improvement suggestions. This helps students understand their strengths and weaknesses and take necessary actions to enhance their career readiness.

The platform uses Python full stack technologies and Natural Language Processing techniques to analyse resumes efficiently. The system is capable of extracting important information such as technical skills, education, certifications, and project details from resumes. Based on this information, the system evaluates resume quality and provides meaningful feedback. This enables students to improve their resumes and align their profiles with industry expectations.

The system also provides a user-friendly web interface that allows students, counsellors, and administrators to interact with the platform easily. Students can upload resumes and view feedback, counsellors can monitor student progress and provide guidance, and administrators can manage the overall system. This makes the platform useful for academic institutions in supporting student placement preparation. The results obtained from system testing confirm that the platform performs efficiently and provides accurate resume analysis and feedback. The system helps students identify missing skills and improve their profiles, which increases their chances of getting shortlisted for job opportunities. The platform also helps bridge the gap between student capabilities and industry requirements. In addition, the system improves the overall placement preparation process by providing continuous evaluation and improvement support. Unlike traditional placement systems that only provide job information, the proposed system focuses on improving student readiness and employability.

The proposed system is scalable and can be used by educational institutions to improve placement success rates. The use of automated resume analysis reduces manual effort and provides faster and reliable results. In future, the system can be enhanced by integrating advanced Artificial Intelligence and Machine Learning techniques to provide more accurate resume analysis and job recommendations. Additional features such as interview preparation modules, job recommendation systems, and skill learning recommendations can also be added. Integration with real-time job portals can further improve the usefulness of the platform. Overall, the Career Readiness and Placements Insights Platform provides an effective, intelligent, and user-friendly solution to improve student career readiness. The system helps students enhance their resumes, develop required skills, and increase their chances of securing job opportunities. This platform serves as a valuable tool for students, counsellors, and educational institutions in supporting career development and improving placement outcomes.

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