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Autoapply and Career Guide System

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Abstract: ***The difficulties of traversing many platforms, entering information repeatedly, and manually monitoring the status of their job applications are present for job seekers in the digital age. In order to solve these inefficiencies, the Auto Apply and Career Guide System provides a cohesive and clever way to automate the job search procedure. A web-based system that allows for one-click job applications, real-time status tracking, and customized career path recommendations is designed and developed in this article. It uses cosine similarity for resume–job match scoring and Natural Language Processing (NLP) approaches to compare resume content with job requirements, hence incorporating skill gap analysis. Additionally, the system offers recommendations for specific learning materials to close identified gaps and improve employability. React.js was used for the front end, and Node.js and Express.js for the backend, Using MongoDB for data administration, the platform prioritizes data protection, scalability, and user experience.***

Keywords: Web application, NLP, job matching, resume parsing, career recommendation, one-click apply, job automation, and skill gap analysis.

I. INTRODUCTION

When applying for jobs across several platforms, job seekers frequently face major obstacles in an increasingly digital and competitive labor market. Repetitive data entry, laborious navigation, and a lack of centralized tracking or direction are common features of the process, which can result in lost opportunities and lower productivity. Additionally, there is a mismatch between the qualifications of candidates and the job criteria because many applicants are not aware of the precise abilities that companies are looking for in their target roles.

We suggest the Auto Apply and Career Guide System, a clever, user-focused platform made to improve and expedite the job search process, as a solution to these problems With the help of the system, users can apply for jobs with just one click, track the progress of their applications in real time, and get tailored career path recommendations based on skill gap research. The platform facilitates ongoing career development by identifying skills gaps and suggesting pertinent learning materials by extracting and processing résumé and job description data using Natural Language Processing (NLP) and similarity algorithms. Performance, scalability, and user security are guaranteed by the system's construction, which makes use of contemporary web technologies such as React.js for the frontend, Node.js and Express.js for the backend, and MongoDB for the database. This article outlines the system's architecture, design process, and functional flow and emphasizes how it may greatly lessen the difficulty of job searching while enabling users to make data-driven, well-informed career decisions.

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II. LITERATURE REVIEW

In recent years, there has been an increase in interest in the fields of intelligent career counselling and automated job application systems. The integration of recommendation systems, machine learning, and natural language processing to close the gap between employers and job searchers has been the subject of numerous studies.

In order to classify work categories and match user skills, A. Patel and M. Roy [1] created a skill gap analysis model that uses clustering algorithms. This shows how unsupervised learning approaches can help detect missing competencies. Their research highlights how crucial skill matching is to improving job preparedness.

In a different study, J. Lee and K. Park [2] presented a framework for processing automated job applications that uses job descriptions and user profiles to produce insightful suggestions. Along with employment monitoring elements, this system lacked a user-interactive skill development component, which is what our suggested approach seeks to address.

In a thorough investigation of intelligent job portals and career planning tools, T. Nguyen et al. [3] noted the shortcomings of the systems in use today, including a deficiency of real-time feedback, disjointed user experiences, and inadequate integration of career path recommendations. The study came to the conclusion that end-to-end automation—from skill development to job discovery—should be the main emphasis of future solutions.

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The current technologies are still unable to provide a smooth experience that integrates career counseling, skill gap assessment, and job application automation in a single interface, even with these improvements. The suggested Auto Apply and Career Guide System expands on these pioneering studies by providing a comprehensive, approachable solution that improves employability by providing learning recommendations and actionable insights.

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III. PROPOSED METHODOLOGY

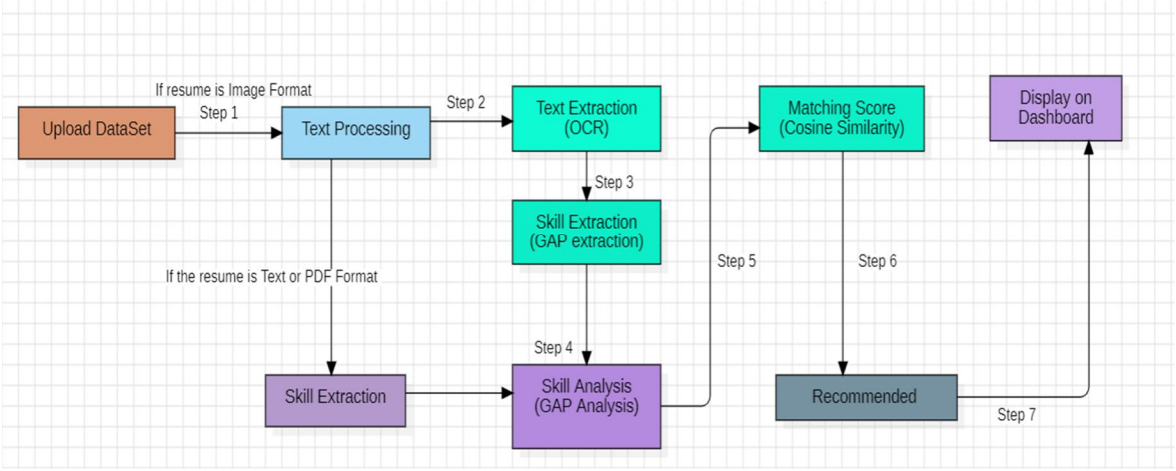
Through the use of a structured pipeline of modules, the Auto Apply and Career Guide System aims to streamline the job search process, minimize manual labour, and offer intelligent career assistance. To provide an end-to-end solution, the methodology combines web technologies with text processing, natural language processing, and talent analysis algorithms. The system architecture, essential elements, data processing methods, and user interaction flow are all covered in detail in this section.

A. System Architecture Overview

- The frontend, backend, and database components are all clearly divided in this client-server architecture: Frontend (Customer): Its fluid and interactive user interface, which was created with React.js, includes modules for skill gap feedback, dashboard visualization, one-click job application, and user registration.
- Backend (Server): Using the Express.js framework and Node.js, this layer manages database connectivity, resume parsing, skill comparison, authentication, and API routing.
- Database: User profiles, résumé information, job advertisements, application status, and skill sets are all stored in MongoDB.

B. Data Processing Pipeline

To extract and analyse information from resumes and job descriptions, the data processing component uses a number of NLP and algorithmic procedures.



Step 1: Text Extraction

- PDF/DOCX files are parsed using text extraction libraries.
- Image files are processed using Tesseract OCR.
- If the document is scanned, it is converted to grayscale for better accuracy using the formula: $\text{Gray} = 0.2989 \times R + 0.5870 \times G + 0.1140 \times B$

Step 2: Text Preprocessing

- Cleaned by removing punctuation, symbols, and stop words.
- Lowercased and tokenized.
  Example:
  Input: "Skilled in Python, SQL, and #React!!"
  Output: "skilled in python SQL react"

Step 3: Skill Extraction

- The cleaned text is compared against a master skill list (technical and soft skills).
- Extracted as sets from both resume and job description.

Step 4: Skill Gap Analysis

- Identifies skills in the job description that are not present in the resume.
  Skill Gap = Required Skills – User Skills
  Example:
  - Resume Skills: {python, SQL}
  - Job Requirements: {python, SQL, docker, react}
  - Gap: {docker, react}

Step 5: Resume–Job Match Scoring

- Match percentage is calculated using cosine similarity between binary skill vectors.

$$\text{Similarity} = \frac{A \cdot B}{||A|| \times ||B||}$$

- Where A = resume skill vector, B = job skill vector.

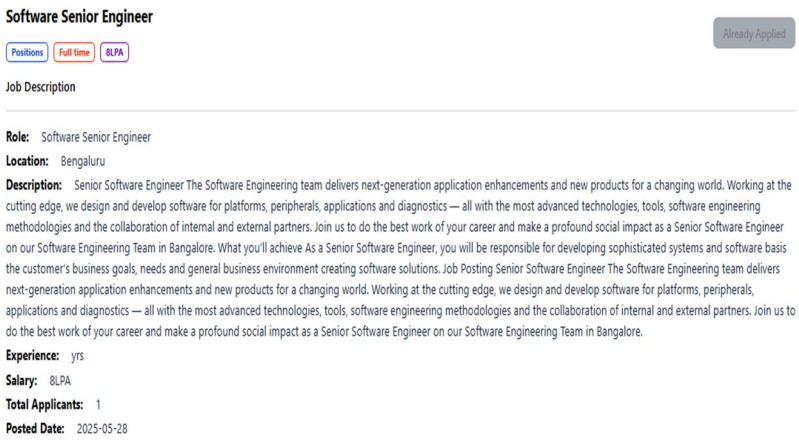
Step 6: Skill Recommendation

- Based on the skill gap, the system recommends online courses or certifications.
  Example Mapping:
  - "docker" → "Docker for Beginners – Coursera"
  - "react" → "React Crash Course – Udemy"

Step 7: Dashboard Visualization

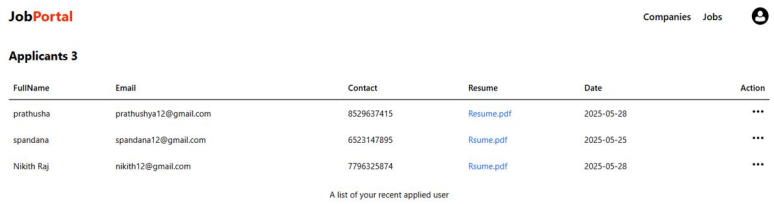
- Shows:
  - Matched Skills (in green)
  - Missing Skills (in red)
  - Recommended Resources
  - Visual graphs (bar chart, pie chart) for skill match score and job readiness

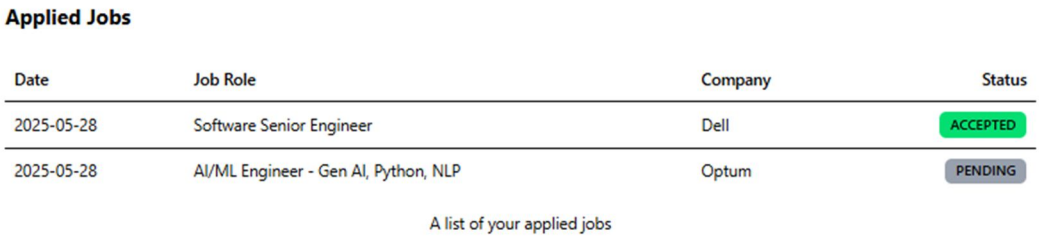
IV. RESULTS











The *Auto Apply and Career Guide System* was implemented and tested to validate its effectiveness in streamlining job applications and providing actionable career guidance. The system successfully integrates resume parsing, skill gap analysis, one-click job application, and personalized recommendations into a single user-friendly platform. The results are presented in terms of functional performance, UI output, and qualitative impact on the job application process.

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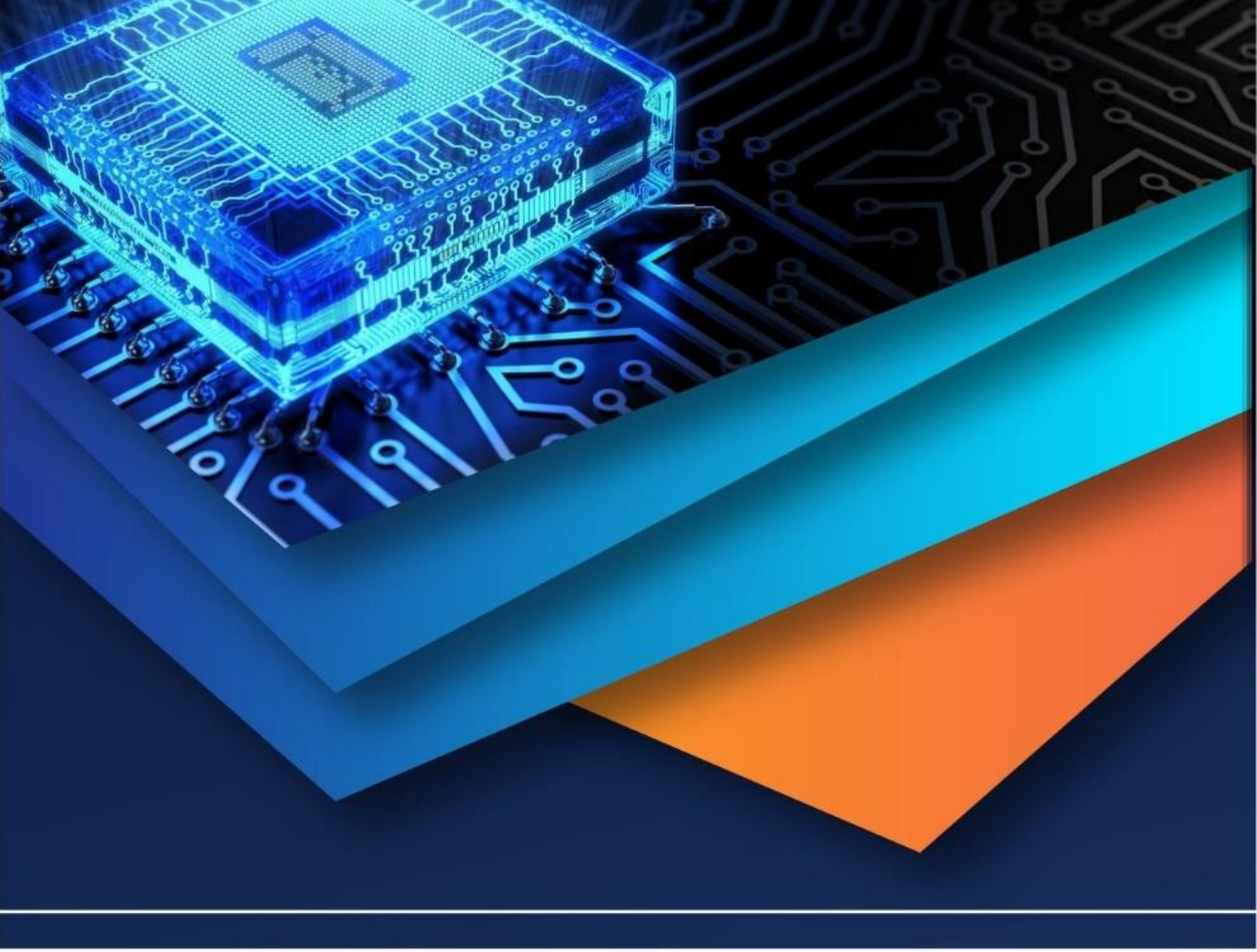
V. CONCLUSION AND FUTURE WORK

The *Auto Apply and Career Guide System* effectively streamlines the job application process through one-click apply, real-time status tracking, and personalized career guidance. By integrating resume parsing, skill gap analysis, and course recommendations, the system enhances both job search efficiency and user employability. In the future, the system can be expanded with features like AI-based resume building, mobile app support, real-time skill assessments, and smarter job matching through machine learning. These enhancements aim to make the platform more intelligent, accessible, and impactful for job seekers.

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