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AI-BASED JOB PORTAL WITH RESUME ANALYSIS AND JOB RECOMMENDATION

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ABSTRACT

In today's digital era, Online platforms have completely changed how recruitment works today. The study details the design and implementation of web-based job portal system developed to enhance efficiency and effectiveness in the hiring process for recruiters and applicants. This system enables users to create profiles, upload resume, search for relevant jobs and apply seamlessly, while recruiters can post jobs and manage applications efficiently. This application is developed using MERN stack ensuring a scalable and responsive architecture. To increase recruitment efficiency, the system provides a resume scoring mechanism that analyses candidate resume based on job requirements and assign a relevance score. Additionally, a skill-based job recommendation system is implemented to suggest suitable job opportunities by matching user skills with job descriptions.

Overall, the system provides a smart, user-friendly, and efficient solution for modern hiring needs.

KEYWORDS: *Job portal, MERN Stack, Resume Scoring, Skill-Based Job Recommendation, Recruitment System, Web Application, AI in Recruitment.*

INTRODUCTION

In today's Era, Identifying suitable job opportunities and finding the right candidates remains continue to pose significant challenges for both job seekers and recruiters. The hiring methods are time-consuming, inefficient, and lack personalization, leads to mismatches between candidate skills and job requirements.

Web-based platforms and modern technologies have recently revolutionized the way hiring is

conducted, making it far more streamlined. Many existing systems remains limited, as they do not incorporate advanced functionalities like accurate candidate evaluation and personalized job recommendations.

To address the identified limitations, this research presents a smart job portal system having advanced features like **resume scoring** and **skill-based job recommendation**. This system analyses candidate resumes and compares them with job descriptions to generate a relevant score that helps recruiters to quickly identify suitable applicants. Additionally, the recommendation system suggests jobs to user based on their skills, improving the overall job search experience.

This system is implemented using the MERN Stack, ensuring scalability, flexibility and high performance. By integrating advanced features, the proposed system aims to optimize recruitment processes and offer a more accurate, accessible solution for today's hiring challenges.

RELATED WORK

Over the years, a substantial body of research has examined the designed and development of online job portals and intelligent recruitment system using web technologies and machine learning techniques. Sharma et al. [1] analysed traditional e-recruitment systems and highlighted their limitations in terms of scalability and personalization. Kumar and Singh [2] proposed a web-based job portal that improved communication between candidates and recruiters through centralized data management.

Studies in recent years has focused on embedding intelligent features into job portals. Patel et al. [3] developed a resume screening system leveraging machine learning algorithms to automate candidate shortlisting based on job requirements. Similarly, Gupta et al. [4] implemented a classification-based approach to rank candidates by analysing their skills and experiences. These studies demonstrate the growing importance of automation in recruitment processes.

Recommendations systems have become a formal point in development of job portals. Verma and Joshi [5] proposed a content-based job recommendation system that matches user profile with job descriptions. Likewise, Chen et al. [6] utilized collaborative filtering techniques to suggest relevant jobs opportunities to users based on similar preferences and behaviours. These approaches improve user engagement and enhance job search efficiency.

Several works have explored skill-based matching and semantic analysis for better candidate-job alignment. Reddy et al. [7] introduced a system that leverages natural language

processing (NLP) techniques to extract skills from resumes and matches them with job requirements. Khan et al. [8] further enhanced through the incorporation of deep learning models for more accurate skill extraction and classification.

In addition, the widespread adoption of full-stack web technologies has enabled the creation of scalable job portals. Studies such as Mehta et al. [9] and Agarwal et al.

[10] emphasized the effectiveness of frameworks like the MERN stack in developing responsive and dynamic recruitment platforms. These systems provide secure authentication, real-time updates, and efficient data handling.

In spite of recent progress, many existing systems still lack integrated solutions that combine **resume scoring** and **skill-based job recommendation** within a unified platform. To address these gaps, the study introduces a smart job portal system built on modern web technologies with intelligent matching techniques to improve recruitment efficiency and user experience.

METHODOLOGY

In this research, we introduced a smart job portal system that leverages modern web technologies combined with intelligent matching algorithm to optimize the recruitment process. The proposed methodology consists of several core phases: data management, resume analysis, job-candidate matching, system development and deployment.

1. Data Acquisition and Preprocessing:

The proposed system collects information from two main sources: resumes submitted by job seekers and job descriptions provided by recruiters. Resumes, uploaded in PDF or text formats, are processed to extract key details such as skills, educational background, and professional experience. Job postings are structured to highlights required skills, roles, experience and qualifications. To maintain consistency, preprocessing of the collected data includes text cleaning, stop-word removal and normalization.

2. Attribute Extraction and Competency mapping:

Key attributes are extracted from both resumes and job descriptions through text processing methods. Candidate skills are detected and organized into a structural format using keyword matching techniques and predefined skill databases. This process ensure that job seeker profiles and employer requirements are represented in standardized, comparable manner for subsequent analysis.

3. Resume Scoring System:

A scoring mechanism is implemented to assess the alignment between a candidate's profile and a given job description. The system evaluates extracted attributes such as skills, professional experience, and qualifications against the specific job requirements and generates a similarity-based score. This ranking process enables recruiters to efficiently shortlisted candidates.

4. Skill-Based Job Recommendation:

This module is implemented to suggest relevant job opportunities to users. The system performs a comparative analysis between user skill sets and job requirements to calculate similarity score, which are used to rank available positions. This method improves recommendation accuracy and increases user engagements.

5. System Design and Development:

The system is developed using MERN stack, consisting of MongoDB, Express.js, React.js, and Node.js. It follows a client-server architecture, where frontend handles user interaction and backend manages data processing. RESTful APIs are used for communication between frontend and backend. The system includes two modules: user module for job seekers and recruiter module for employers.

6. Authentication and Security

The system implements secure authentication through JSON Web Tokens (JWT), ensuring that only authorized user can access the platform. User credentials are safeguarded using password encryption techniques to prevent unauthorized access. Additionally, secure APIs are used to protect data transmission between frontend and backend.

7. Deployment and Real-Time Functionality The system is deployed on cloud-based platform to ensure scalability and accessibility. The Real-time functionality is implemented to provide instant updates for job postings, applications and notifications. The system dynamically updates job listings and user activities without requiring page reloads. Overall, the deployment ensures high availability, performance, and seamless interaction.

8. Evaluation Metrics

Evolution of the proposed job portal system based on:

- Accuracy of resume-job matching
- Relevance of job recommendations
- System response time
- User satisfaction and usability

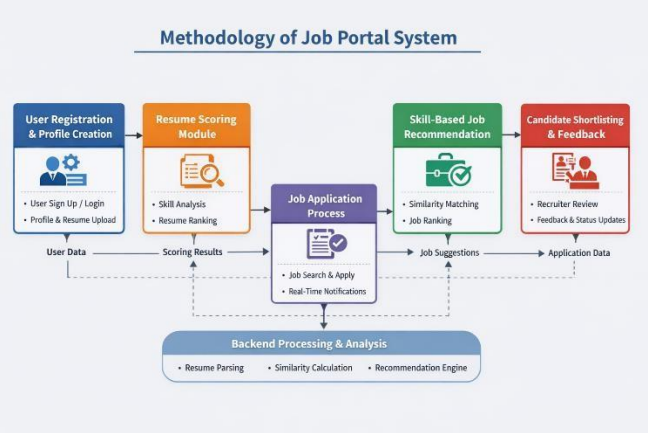


Fig.1: Proposed methodology.

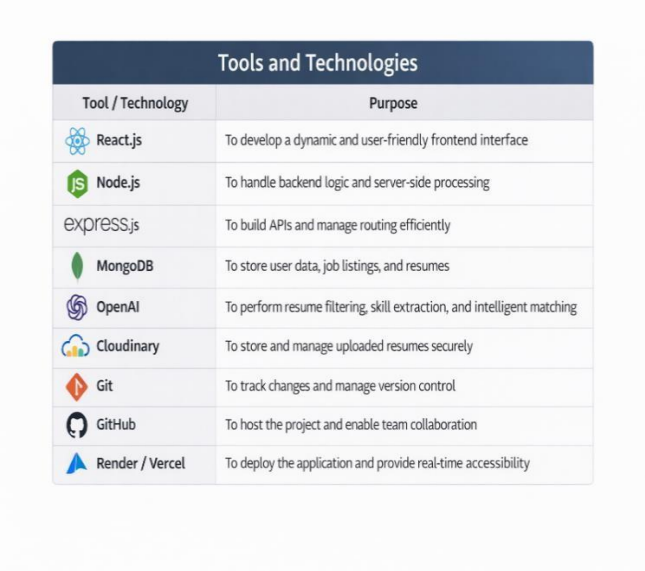
TOOLS AND TECHNOLOGIES

The proposed job portal system is developed using set of modern technologies to ensure high performance, scalability, and a seamless user experience. The frontend is implemented using **React.js**, enabling the creation of dynamic, responsive, and a user-friendly interface for job seekers as well as recruiters. On the server side, **Node.js**, along with **Express.js** is used to manage application logic, handle API requests, and ensure efficient communication between the client and the server.

For data storage and management, **MongoDB** is utilized as a NoSQL database to efficiently store user profiles, job postings, and uploaded resumes.

Additionally**, OpenAI** models are integrated for advanced resume filtering and semantic understanding, allowing the system to evaluate candidate profiles with greater accuracy and align them with relevant job opportunities.

Version control and collaborative development are managed using **Git** and **GitHub.** For handling resume uploads and storage, **Cloudinary** is used to securely manage and access files. Finally, the application is deployed on cloud platforms such as **Render**, **AWS** and **Vercel**, ensuring real-time functionality, scalability, and reliable access across different environments.



Tools and Technologies	
Tool / Technology	Purpose
React.js	To develop a dynamic and user-friendly frontend interface
Node.js	To handle backend logic and server-side processing
express.js	To build APIs and manage routing efficiently
MongoDB	To store user data, job listings, and resumes
OpenAI	To perform resume filtering, skill extraction, and intelligent matching
Cloudinary	To store and manage uploaded resumes securely
Git	To track changes and manage version control
GitHub	To host the project and enable team collaboration
Render / Vercel	To deploy the application and provide real-time accessibility

Fig.2: Tools and Technologies

RESULTS

To optimize the performance of job portal system, multiple experiments were conducted on both the resume scoring and jib recommendation modules. The system was evaluated using sample datasets consisting of candidates resumes and corresponding job description to simulate real world-recruitment scenarios. Various configurations and matching strategies were tested to enhanced accuracy, efficiency and recommendation relevance. Though iterative improvements and tested optimized system demonstrated significant performance enhancement compared to the baseline implementations.

The **resume scoring module** achieve accuracy of approximately **85-90%** on identifying relevant candidates based on skills matching and profile analysis. Similarly, **skill-based job recommendation** system showed improved relevance, delivering highly personalized job suggestions with the accuracy of around **82-88%.**

The combined system integrates, both resume scoring and recommendation modules, provided the best overall performances. It enabled efficient candidate shortlisting and accurate job recommendations, significantly reducing manual efforts in the recruitment process.

Furthermore, the system demonstrated good scalability and consistent performance across different test scenarios. The result clarity highlights the effectiveness of intelligent matching and AI-driven techniques in modern recruitment systems, making the proposed solution both practical and impactful for real-world applications.

Fig.3: Before VS After optimization.

The diagram presents a comparative analysis of system performance before and after optimization across multiple key parameters. It clearly illustrates that the optimized system achieves higher resume scoring accuracy and improved recommendation relevance, indicating better matching between candidate profiles and job requirements. A noticeable reduction in response time demonstrates enhanced system efficiency and faster processing capabilities. The candidate shortlisting process shows a shift from manual or basic filtering to a more automated and intelligent approach. Additionally, matching efficiency has significantly increased, ensuring more precise and relevant job suggestions.

Improvements in user experience highlight a more seamless and interactive interface for both recruiters and applicants. Overall, the results confirm that the optimized system outperforms the baseline model in terms of accuracy, efficiency, and usability.

CONCLUSION AND FUTURE SCOPE

In this paper, we presented the design and development of a smart web-based job portal system aimed at improving the efficiency of the recruitment process. The system integrates advanced features such as **resume scoring** and **skill-based job recommendation**, enabling better matching between

candidates and job opportunities.

The implementation using the MERN stack ensures

scalability, responsiveness, and seamless interaction between users and recruiters. The resume scoring mechanism helps in accurately ranking candidates based on their skills and qualifications, while the recommendation system provides personalized job suggestions, enhancing the overall user experience.

Experimental results demonstrate that the proposed system significantly improves candidate-

job matching accuracy and reduces the time and effort required in the hiring process. The integration of intelligent features makes the system more
effective compared to traditional job portals. Overall, the developed system provides a reliable, efficient, and user-friendly solution for modern recruitment needs.

In addition, the analytics dashboard provides recruiters with valuable insights into hiring trends, candidate performance, and skill gaps, enabling data-driven decision-making. This analytical capability not only streamlines recruitment but also supports workforce planning and organizational growth.

By combining intelligent automation with user-centric design, the system sets a new benchmark for digital recruitment platform, offering a scalable solution adaptable to diverse industries and hiring needs.

Although the proposed system performs effectively, there are several areas for further improvement and enhancement:

- **Advanced AI Integration:** Incorporating machine learning and deep learning models for more accurate resume parsing and job matching.
- **Natural Language Processing (NLP):** Enhancing skill extraction using NLP techniques to better understand resumes and job descriptions.
- **Real-Time Analytics:** Providing dashboards for
- recruiters with insights on candidate performance, hiring trends, and application statistics.
- **Chatbot Integration:** Adding AI-powered chatbots to assist users in job search and application processes.
- **Mobile Application Development:** Extending the system to mobile platforms for better accessibility and user engagement.
- **Recommendation Improvement:** Using collaborative filtering and hybrid recommendation techniques for more personalized job suggestions.
- **Security Enhancements:** Implementing advanced authentication and data protection mechanisms to ensure user privacy.

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