

Design and Development of an AI-Based Job Recommendation System

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Abstract—The development of online job portals has led to an increase in the availability of job opportunities. However, at the same time, it has created challenges in helping users find the right jobs based on their skills and interests. This paper focuses on the design and development of an AI-based job recommendation system that assists users in identifying suitable job opportunities in an efficient manner. The system utilizes machine learning algorithms and data analysis techniques to analyze the users' profiles based on their educational background, skills, and experience. The proposed system aims to facilitate the job search process by reducing the complexity and enhancing the accuracy of the job matching process. The system is created in the form of a web application where users can register their accounts and upload their resumes to obtain suitable job recommendations.

I. INTRODUCTION

With the rise of the need for more employment opportunities, many online job websites have emerged. However, users face difficulties in searching for jobs that match their educational qualifications and skills. In the conventional online job search system, users have to manually go through a large number of job opportunities. This is a tedious process for users and may not provide accurate results. To resolve this problem, the proposed CareerNest system uses an AI-based recommendation system to provide accurate job suggestions to the user based on their profile information such as skills, educational background, experience, and job interests. The system is developed with a simple user interface that provides functionalities such as user registration, login, and recommendation to the user.

II. LITERATURE REVIEW

In the domain of job recommendation systems, various researchers have made significant contributions to this area by employing different methodologies. Some studies have proven that machine learning algorithms can be effectively used to analyze user profiles and recommend jobs according to the skills of the user by employing classification algorithms. Other studies have focused on employing collaborative filtering methods to recommend jobs to users by analyzing user behavior and past job searches, especially by comparing user profiles. Another method of recommending jobs to users is by employing content-based recommendation systems, where job suggestions are made by analyzing user profiles according to keywords. Even though significant contributions have been made to this area, most of these systems are not properly personalized. Therefore, the proposed system will be an improvement over existing systems by employing user profile analysis techniques.

III. SYSTEM ARCHITECTURE

The components of the structure of the AI-based job recommendation system are as follows:

1. User Interface

The user interface is the component of the system that enables users to create profiles, upload their resumes, and view their recommended jobs.

2. Database

The database is the component of the system that stores user information, job information, and skills.

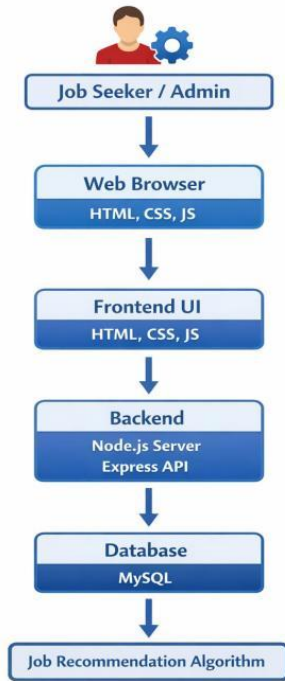
3. AI Recommendation Engine

The component of the system that enables users to match their profiles with job requirements is the AI recommendation engine.

4. Job Data Processing Module

The component of the system that enables the collection of job information is the job data processing module.

5. Recommendation



Output

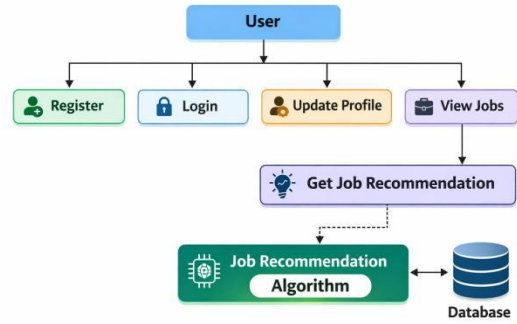
The structure shows efficient data processing and accurate job recommendations.

IV. METHODOLOGY

The suggested system would employ machine learning to analyze the user information and recommend relevant job opportunities.

The steps to be followed in this process are:

1. Data Collection-User information like education, skill set, work experience, etc., is collected while the user creates his or her profile.
2. Data Preprocessing-The collected user information is preprocessed, making it suitable for analysis.
3. Feature Extraction-Relevant information like skill set, job role, and experience level is extracted from the user profile.



4. Machine Learning Algorithm-The algorithm used in the system is a recommendation algorithm. This algorithm checks the features and compares them with the job requirements in the database.

5. Job Matching-The system calculates the similarity between the skills provided by the users and the job requirements.

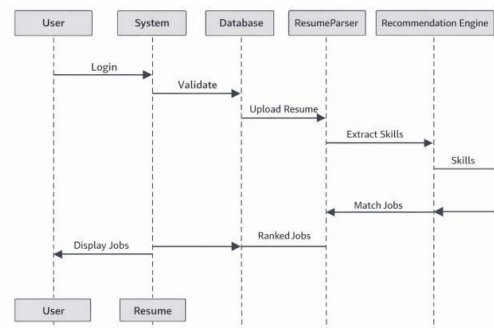
6. Recommendation Generation-The system generates a list of suitable job opportunities for the users.

V. SYSTEM DESIGN

System design is where the design of the entire CareerNest – AI Job Recommendation System is described. It is where the entire design is shown, indicating how each component in the system works together to provide users with job recommendations. There are three main components in the system's design:

- i. Presentation Layer (Front-end)
- ii. Application Layer (Back-end)
- iii. Data Layer (Database)

The front end is where the user interacts with the system, while the back end processes the request and interacts with the database.



DATABASE DESIGN

The database is designed to store user information and job details.

Users Table

Field Name	Type
name	VARCHAR
email	VARCHAR
phone	VARCHAR
password	VARCHAR
experience	VARCHAR

Jobs Table

Field Name	Type
Job_id	INT
Job_title	VARCHAR
company	VARCHAR
skills	VARCHAR
location	VARCHAR

VI. SYSTEM IMPLEMENTATION

The suggested job recommendation system is implemented as a web application with the help of modern web programming techniques.

- Front End-HTML, CSS, and JavaScript are employed to create the user interface.
- Back End-Python or PHP may be employed to create the back end.
- Database-MySQL is employed to store user profiles and job details.
- AI Module-Machine learning libraries like Scikit-learn or TensorFlow may be employed to create the recommendation engine.

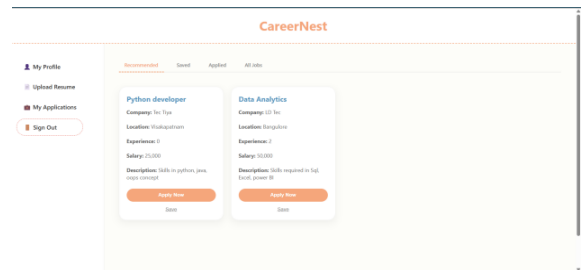
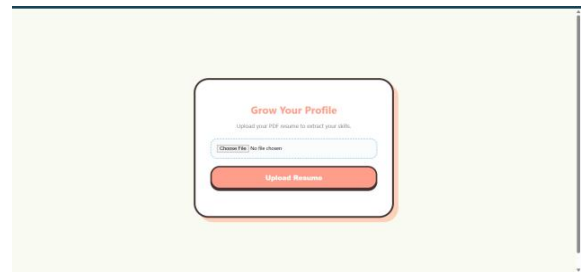
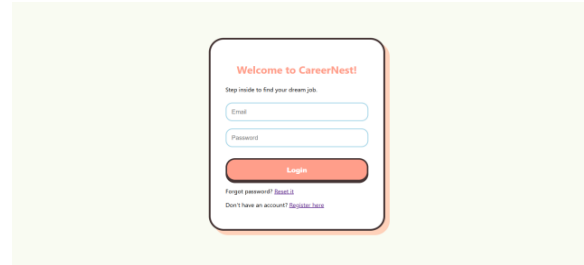
Key Features of the System:

- User Registration and Login
- Resume Upload Facility
- Skill-Based Recommendation System
- Job Listing Facility
- Personalized Recommendation Dashboard

VII. RESULTS AND DISCUSSION

The developed system has successfully demonstrated that it has the capability to provide personalized job recommendations. This is because the recommendation engine uses user profiling to determine the available job opportunities that match

the skills of the user. This system has reduced the time taken to search for a job as well as improved the accuracy of job recommendations as opposed to using a search engine. From the test results, the recommendation system has been able to provide relevant job recommendations that match the user's skills.



VIII. CONCLUSION

In this paper, the design and development of an AI-based job recommendation system are presented. The aim of this system is to assist users in finding job opportunities efficiently.

The proposed system will enhance the efficiency of the job search process. In the future, the system can be improved by incorporating various AI models, real-time job data, and mobile applications.

REFERENCES

- [1] J. Smith and K. Patel, "Job Recommendation Systems using Machine Learning Techniques,"

- IEEE International Conference on Data Science, pp. 120–125, 2021.
- [2] S.Gupta and R. Kumar, “Personalized Job Recommendation using Content-Based Filtering,” *International Journal of Computer Applications*, vol. 178, no. 7, pp. 25–30, 2019.
 - [3] X. Amatriain and J. Basilico, “Recommender systems in industry: A Netflix case study,” *IEEE Internet Computing*, vol. 16, no. 3, pp. 69–76, 2012.
 - [4] G. Adomavicius and A. Tuzhilin, “Toward the next generation of recommender systems: A survey of the state-of-the-art and possible extensions,” *IEEE Transactions on Knowledge and Data Engineering*, vol. 17, no. 6, pp. 734–749, 2005.
 - [5] F. Ricci, L. Rokach, and B. Shapira, “Introduction to recommender systems handbook,” Springer, 2011.
 - [6] S. Russell and P. Norvig, *Artificial Intelligence: A Modern Approach*,