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Job Recommendation System for Daily Paid Workers using Machine Learning

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Abstract: ***In developing countries where unskilled workers often face challenges in finding suitable employment, this is where recommendation systems come in, as they can help users find information that is specific to their interests. Using the system decision-making and predictions through algorithms trained on available data across multiple domains makes it easy for users to access pertinent information. One area where recommendation systems can have a significant impact is in helping unskilled workers find jobs based on their skills and interests. Although there are many jobs available for skilled professionals, it can be challenging for daily wage workers to find suitable employment due to a lack of information and awareness. Currently, there are no relevant recommendation systems available to help these workers. In this research, we propose a "Job recommendation system for daily paid workers using Machine Learning" that analyzes a worker's skills and interests to find appropriate job opportunities. To ensure that the system is robust, we consider a wide range of factors when recommending jobs to daily wage workers.***

Keywords: Recommendation System, Support Vector Machine (SVM), K-Nearest Neighbour (KNN), K-Means Clustering, Machine Learning

I. INTRODUCTION

The current job market offers a vast array of opportunities for skilled and literate professionals. However, unskilled workers who work on a daily wage basis often face challenges in finding suitable jobs due to a lack of information and awareness. To address this issue, we propose the development of a "Job Recommendation System for Daily Paid Workers" that utilizes machine learning algorithms to analyze a worker's skills and interests and recommend appropriate jobs in their area of expertise. This system can play a vital role in helping daily wage workers find employment that is relevant to their skills and interests. Recommendation systems are widely used to handle the overwhelming amount of data or information available in every domain. These systems enable users to concentrate on data that is more relevant to their area of interest. In this context, a job recommendation system for daily paid workers can help alleviate the challenges faced by workers in finding suitable employment opportunities. To make the system robust, a wide variety of factors are taken into consideration while recommending jobs to daily wage workers. The system is designed to recommend multiple jobs, and workers can apply for jobs available through the system. The contractor will check the details of the workers and accept or reject them after verification. Personal details about the contractor and workers are stored in the database, and only job recommendations are made to the job seeker. With millions of candidates browsing through job postings every day, the need for accurate, effective, meaningful, and transparent job recommendations is apparent more than ever. An online job recommendation system for daily paid workers can be a central component of the modern recruitment industry, providing a valuable resource for workers seeking employment opportunities that match their skills and interests.

II. RELATED WORK

In recent years, various research studies have been conducted in the field of job recommendation systems. Some of the most popular approaches used in these studies include collaborative filtering, content-based filtering, and hybrid filtering. Collaborative filtering works on the principle of generating recommendations based on the behaviour of similar users. Content-based filtering, on the other hand, recommends jobs based on the characteristics of the job and the user's preferences. Hybrid filtering is a combination of both the above-mentioned approaches.

1) Job recommendation system that uses the KMeans clustering method to cluster job vacancies based on the required skills and experience. The proposed system aims to help job seekers find suitable jobs by recommending job vacancies that match their skills and experience. The paper describes the implementation of the K-Means clustering method, which involves the following steps: data preprocessing, feature selection, K-Means clustering, and job recommendation. The authors used the Jaccard similarity coefficient to measure the similarity between job vacancies based on the required skills and experience. The authors evaluated the proposed system using a dataset of job vacancies from a job portal in Indonesia. The experimental results show that the proposed system can effectively cluster job vacancies based on the required skills and experience and provide accurate job recommendations to job seekers.

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2) The system aims to provide job recommendations to job seekers based on their skills, experience, and other relevant information. The paper describes the use of ontologies to model user profiles, which involves defining concepts, properties, and relationships between them. The authors used the Web Ontology Language (OWL) to define the ontologies and used Protégé, an ontology editor, to create and edit the ontologies. The authors evaluated the proposed system using a dataset of job vacancies and user profiles. The experimental results show that the proposed system can effectively recommend jobs to job seekers based on their skills and experience.

3) Author recommends a new content-based job recommendation algorithm called FoDRA (Featurebased One-class Dynamic Recommendation Algorithm) for job seeking and recruiting. The algorithm uses machine learning techniques to recommend job openings to job seekers based on their skills, experience, and other relevant information. The paper describes the implementation of the FoDRA algorithm, which involves the following steps: data preprocessing, feature extraction, feature selection, and job recommendation. The authors used several machine learning algorithms, including Principal Component Analysis (PCA) and Support Vector Machines (SVM), to implement the FoDRA algorithm. The authors evaluated the proposed algorithm using a dataset of job vacancies and user profiles. The experimental results show that the FoDRA algorithm can effectively recommend job openings to job seekers based on their skills and experience.

4) JobFit, uses job seekers' skills, education, and work experience to recommend suitable job openings. The system collects job seeker data through a web-based application and stores it in a database. The recommendation engine uses this data along with job descriptions to create a model that matches job seekers with job openings. The authors employed two algorithms, namely Collaborative Filtering (CF) and Content-based Filtering (CBF) algorithms. The CF algorithm looks at the behavior of other job seekers to recommend jobs. The CBF algorithm recommends jobs based on the job seeker's profile. Overall, the JobFit system presents a promising solution to the problem of job matching. The use of machine learning and recommendation engine techniques enables the system to provide job seekers with personalized and relevant job recommendations. The system has the potential to save job seekers time and effort while also increasing their chances of finding suitable employment.

5) Using clustering techniques to group job seekers with similar preferences and job requirements for the proposed system. The system then recommends jobs to job seekers based on the preferences and job requirements of the cluster to which they belong. The authors employ two clustering algorithms, namely K-means and Fuzzy Kmeans algorithms, to group job seekers. The authors further explored the use of adaptive methods for job recommendation by considering the temporal dynamics of job seekers' preferences and job requirements. The results of the experiment showed that the proposed method improved the accuracy of job recommendations compared to the static user clustering approach. Overall, the paper presents an innovative approach to job recommendation based on adaptive methods and user clustering. The use of clustering techniques allows the system to provide personalized job recommendations based on job seekers' preferences and job requirements. The proposed system has the potential to improve the efficiency and effectiveness of job search for job seekers.

6) Decision tree model to capture the job seeker's preferences and decision-making process as they progress through the job selection process. The system recommends jobs to the job seeker based on their current stage in the decision-making process and the job seeker's preferences captured by the decision tree model. The authors evaluated the performance of the system using data from a job portal. The results showed that the proposed system outperformed traditional job recommendation systems in terms of recommendation accuracy. The study also found that the proposed system's recommendation accuracy improved as the job seeker progressed through the job selection process. Overall, the paper presents an innovative approach to job recommendation that takes into account the progression of a job seeker's job selection process. The use of a decision tree model allows the system to capture the job seeker's evolving preferences and decision-making process, resulting in more personalized job recommendations. The proposed system has the potential to improve the efficiency and effectiveness of job search for job seekers.

7) The authors first introduce the problem of job recommendation, which is the task of suggesting job opportunities to job seekers based on their preferences and qualifications. They note that traditional recommendation systems often use static user profiles, which may not accurately reflect the user's current preferences and skills. To address this limitation, the authors propose a dynamic user profile-based recommendation system. The system collects user activity data, such as job search history and job application outcomes, and uses this data to update the user's profile over time. The system then uses this updated profile to generate job recommendations that are more relevant to the user's current interests and qualifications. Architecture of the system, which consists of three main components: data collection, profile update, and recommendation generation. They also discuss the algorithms used in each component, such as collaborative filtering and content-based filtering. The system has the potential to help job seekers find more relevant job opportunities and make more informed career decisions.

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III. PROPOSED SYSTEM

The proposed system is a Web-Based Job portal application. Employees can browse through jobs posted and can apply for them. Employers can go through the applicants and hire the workers. Language used for back-end coding is Python with flask framework templates are created so that the data can be presented in a user-friendly format. For the database instance, the web server uses MySQL. We have used Support Vector Machine algorithm which gives good performance and got 94.31 percentage accuracy using SVM algorithm. There are two major actors for the project: Labour who visits the portal for job search, Contractor who posts the jobs. The labour and contractor need to register themselves for applying for a job, posting a job, and so on. The portal has a filter search for the job seeker to search according to their required preferences. At every stage of any data entry or update, there are validations to ensure that the data entered by the user are valid, which could create problems later.

IV. SYSTEM ARCHITECTURE

The Fig.1 gives an overview of the approach towards building a basic version of employment recommendation system that will help labour to get their skillset jobs on daily basis.

1) Input Labour data- We give input as data of labour and what are their skills.
2) Input Contractor data - Contractor posting jobs available as suitable location with numbers of labour requirements.
3) Prediction - After entering the data, labours can see the works available
4) Apply algorithms- To recommend jobs we have used SVM classifier that help to predict the suitable jobs.
5) Combine the solution- Both the jobs are match.
6) Input Labour data- We give input as data of labour and what are their skills.
7) Input Contractor data - Contractor posting jobs available as suitable location with numbers of labour requirements.
8) Prediction - After entering the data, labours can see the works available
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10) Combine the solution- Both the jobs are match.
11) Map Location - Jobs available on Maps according to location.
12) Final Result - Job is recommended on Maps in nearby location of labour.
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14) Input Contractor data - Contractor posting jobs available as suitable location with numbers of labour requirements.
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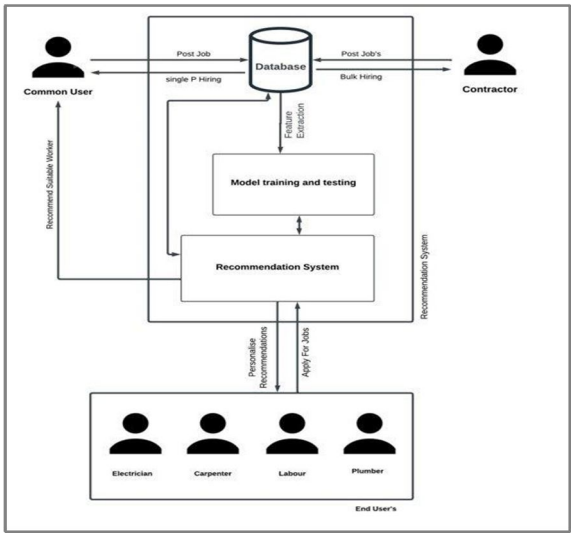


Fig. 1. System Architecture

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V. CONCLUSION

This report studied 10 papers. The highlights and observation are reported in chapter 2. The gap has been analysed, based on which problem statement is designed along with its objectives. The detail plan of all the activities is mentioned in section 1.5. This report addresses the problem of Unemployment in workers who works on daily wages basis. Given an input of skills of worker, the goal is to recommend the best suitable personalized recommended job to the worker as per his skills, Location, wages etc. Basically, this research area consists of personalized recommendation to provide jobs nearby with using machine learning. We can say that the accuracy of our chosen model is good as compare to the models trained in the reference papers, however, with a huge scope for improvement.

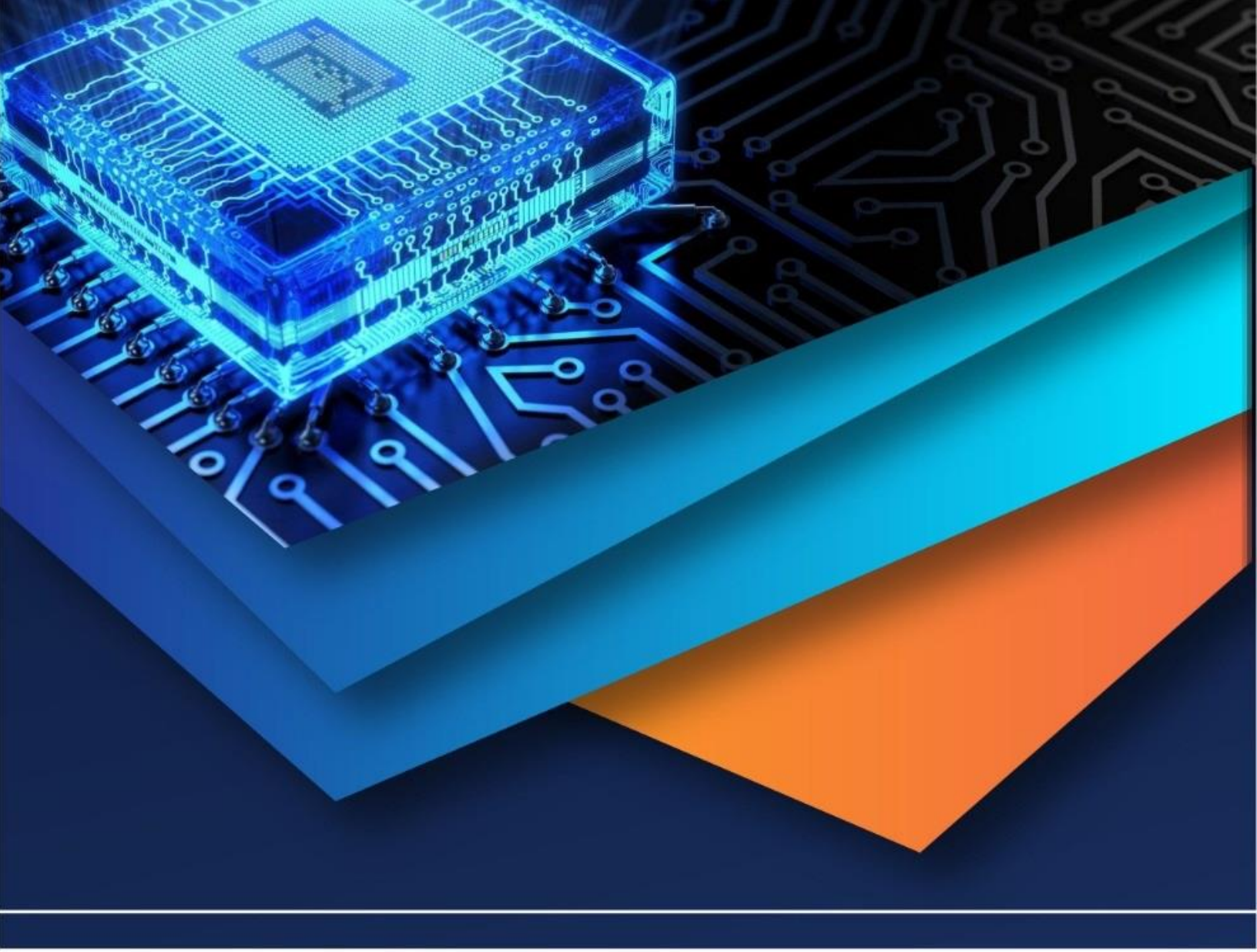
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