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Job Portal for Unskilled Workers

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Abstract – *The unorganized sector forms a significant portion of the workforce in developing countries, particularly in India. One of the important sector of the Indian economy is the informal labour market. It is difficult for workers from various regions of the country to contact industry or entrepreneurs for jobs that are far from their state/settlement, which causes an increase in the country's unemployment rate. So, in search of job opportunities, they contact labour developers who take some of their wages as a commission to link them up. In this paper, we propose a web portal with a job recommender system to connect unorganized workers to their employers and find the right job. This proposal will solve unorganized workers' difficulties with informal employment and will connect unskilled labourers from different parts of the nation for their employment without any commission and bring positive change in the employment rate.*

Key Words: **Unorganised sector, Job portal, Job Recommender System, Collaborative filtering.**

1.INTRODUCTION

Unskilled labourers in India face a significant challenge in finding the right work located outside of their village and in other parts of the country. Currently, industries obtain unskilled labourers from labour brokers, who charge a percentage of the unskilled worker's salary as a commission for connecting them.

Nowadays, an online job portal has become the standard medium for connecting job seekers and employers. A job portal is a website that provides job seekers as well as employers with online information. A job portal assists job seekers in locating the best jobs for them. There are many platforms for skilled workers to display their resumes and search for jobs and enhance their skills by posting updates but not for unskilled labourers.

This portal is simple and easy to use. It also has a job recommender system to help find the right job based on the workers' preferences and other similar users' interactions.

So, the project provides commission-free employment opportunities for unskilled labourers from all over the country.

2. LITERATURE SURVEY

A. Muthusamy and Dr M. Syed Ibrahim [1] have discussed in their paper the various issues that unskilled workers face, such as transportation, lack of technology, social status, lower wages, working conditions, and so on. Unskilled labourers find it difficult to move from one state to another in search of work as there are fewer job opportunities in their area. The type of work they do is reliant on their family background, so they have a hard time finding a job in their field. As a result, by implementing an online job portal for unskilled labourers, they will be able to find jobs that interest them and also be able to connect with entrepreneurs from other states.

Parry and Tyson [2] researched over six years using survey methods and interview methods on the recruitment activities of companies. According to the interviewees, the company used online recruitment to save on the cost of hiring and enhance the efficiency of the recruitment process. As a result, by implementing an online job portal, recruiters can reduce the time it takes to hire employees because posting advertisements on the Internet is faster. Since it saves time, has quick response features for checking application status, and allows for online resume development, online recruitment is cost-effective.

Kar and Bhattacharya [3] have identified factors that could influence the effectiveness of job portals as well as elements of job portals that could improve users' satisfaction with the portal's use. The distribution of curriculum vitae and face-to-face interaction were key factors in the job portal's popularity. Respondents would be more satisfied if chat and help desk/call centre services were available on the job portal.

Vijay Desai, Dheeraj Bhal, Shreekumar Vibhandik, Isra Fatma [4] have compared two types of recommendation algorithms for online job portals: content-based filtering and collaborative filtering. They used the candidates' background information, recruitment details, and the weight of the candidates' preferred jobs in their recommendation algorithm. As a result of their research, they concluded that the collaborative-based filtering algorithm performs better in terms of performance and overall factors. Other algorithms, in addition to collaborative filtering, can be used for further optimization.

Qing Zhou, Fenglu Liao, Liang Ge, and Jianglin Sun [5] proposed a personalised preference collaborative filtering recommendation algorithm that recommends jobs for graduates based on their records and preferences. The system divides the graduates into groups and then uses the Bayesian personalised ranking method to assign scores to each group. Finally, the scores and personal preferences are

combined to make job recommendations. Unlike existing job recommendation methods, the proposed system suggests jobs for graduates based on both group records of job preferences and graduate preferences for jobs. Even though the collaborative filtering method is extremely effective in job recommendation, it cannot be used in situations where there is no job record. With the collaborative filtering method, this system accurately solves the problem of job recommendation with no historical job records and the integration of graduate preferences for jobs (like location).

3. ARCHITECTURE OVERVIEW

3.1 RESTful Web Application

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.

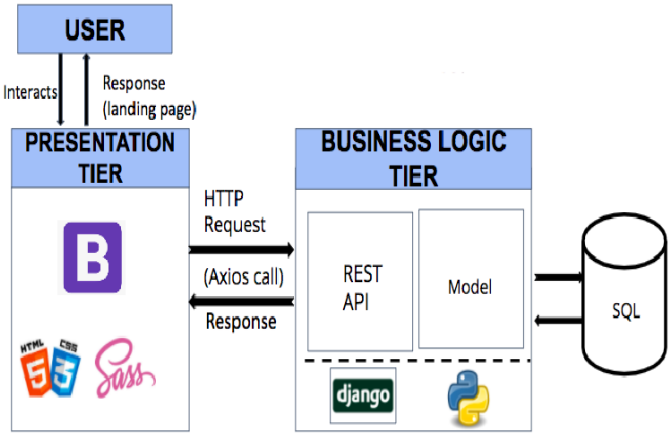

Fig -1: MVC Architecture

To manage the RESTful API calls from any REST interface, a web server based on the Django framework is used. For the database instance, the web server uses SQLite. Each call has a specific path that points to a distinct method in the respective class.

Suitable templates are created for the Django framework so that the data can be presented in a user-friendly format. The template is written in HTML, CSS, and JavaScript in an HTML file. The requests by a user are verified and communicated to the server via interfaces.

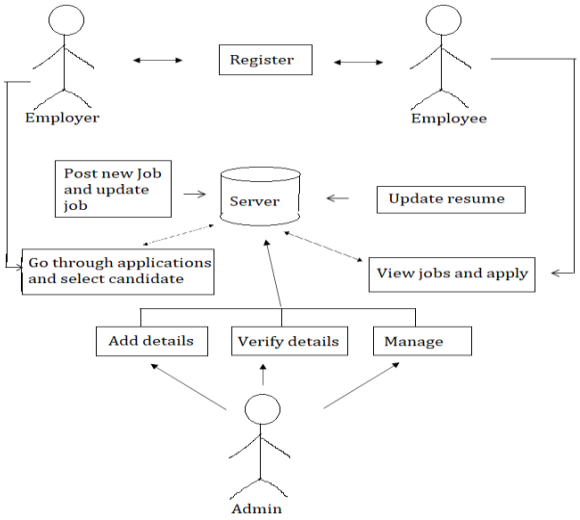

Fig -2: System Architecture

There are three major actors for the project: Job Seeker who visits the portal for job search, Employer who posts the jobs and admin who maintains the website and keeps it running.

The employee and employers need to register themselves for applying for a job, saving a job, posting a job, and so on. Jobseekers can also save the job according to their needs.

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.

Admin performs the actions that need to be done for keeping the portal running.

3.2 Job Recommender System

In this project, a User-Based Collaborative Filtering is used to recommend the best available jobs based on user preferences. Using this technique, users will be recommended jobs that they may be interested in based on the interactions on that item by other users with similar preferences to the target user. The formula determines the user's similarities, and the user's interest is predicted.

Working and Data Flow:

To recommend a job to a candidate, the Recommendation System requires some features. The features for the User are User Id, Username, Gender, Date of birth, Role, Job category, Job type, Preferred job location, Phone number. The features for the Jobs are Job Id, Job title, Location, Job type, Description, Job category, Salary, Company Name.

Upon receiving the API call to fetch the recommended jobs for the user with "UserId" passed in the parameters, the jobs, users and the application data are fetched from the database.

The data is first pre-processed and data needed for training the model are collected. Similar users for the user with "UserId" are found with the features gender, preferred job location, job category and creating TD-IDF vectorizer. Based on similar users' job applications history, a set of jobs are recommended for the user for whom the request was made.

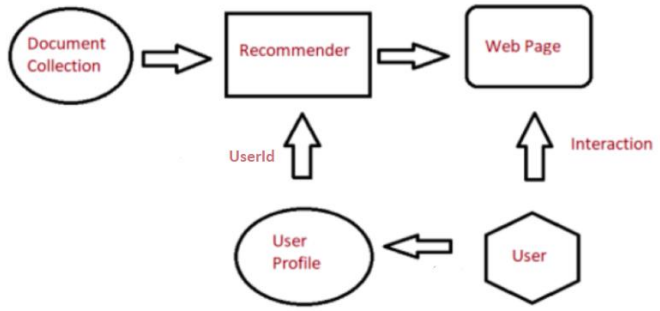

Fig -3: Data flow diagram for the recommender

4. RESULT

A dataset was created by adding 10 categories, 5 job locations, 50 Jobs, 160 users and 500 users' applications.

Through postman, the API call for recommended jobs was sent to the server with the UserId as the parameter. Firstly, the Recommendation system fetches the list of users along with the jobs list and users' applications data. After calculating td-idf weights, similar users are found. Based on the similar users' applications details, the jobs are recommended.

The modules were tested again and results were recorded. A RESTful API Web application was designed and created for the portal and the recommender system was connected to it.

5. CONCLUSIONS

This project's purpose is to create a job portal for unskilled workers. It aims to automate the process of applying for any job, posting new job openings, and so on. It also recommends suitable jobs to the workers based on their preferences and provides them better options while searching for the job.

The merits are as follows:
1. Users can enter data into this project using simple and interactive forms. It is very helpful for the users to enter the required data in such a simple manner.
2. The user is primarily concerned with the accuracy of the information they are entering. Validations are present at every stage to ensure valid data is entered by the user.

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