Intelligent Job Recommendation System

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Overview

Nowadays Internet becomes a major platform for job seekers to look for jobs. However, most of the job searching engines available in the market mainly focuses on posting job advertisement from employers only.

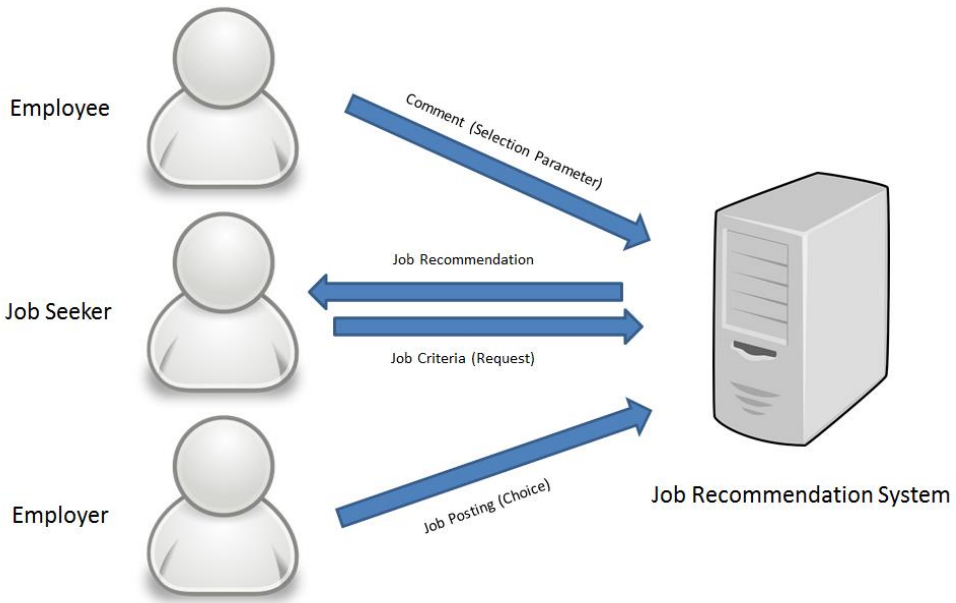
In this project, we will create a job recommendation system that is driven by employees rather than employers. Users can anonymously post reviews of their own jobs to reveal some information of the job. Afterwards, users can search for information of different jobs according to their preferences and the system will recommend suitable job positions based on the reviews stored. Companies may also post job ads on these reviewed jobs for hiring purpose.

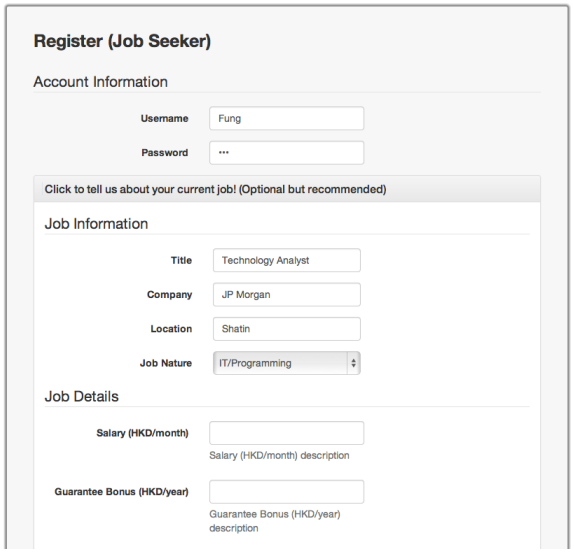
The ultimate goal of the system is to make use of the crowd wisdom to evaluate different job opportunities and openings available in the job market, and hence suggest suitable job positions to job seekers.

Design

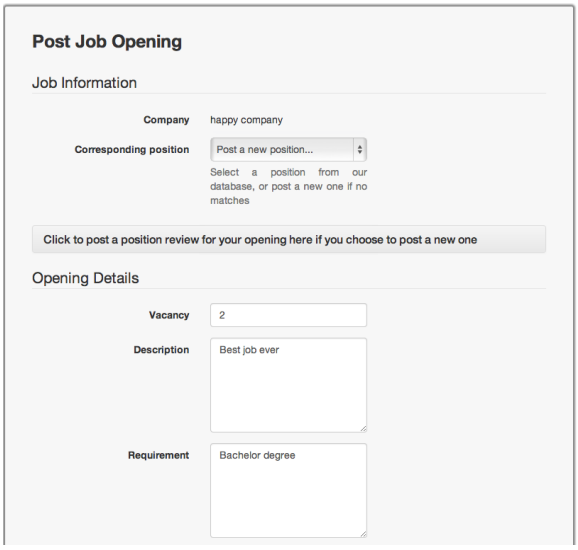
There will be four entities involved in the recommendation process.

Employers: Provide job opening information (Input)
Employees: Rate and provide job information (Input)
Job Seekers: Provide job-searching criteria (Input)
The system: Match job seeker to job opening (Output)



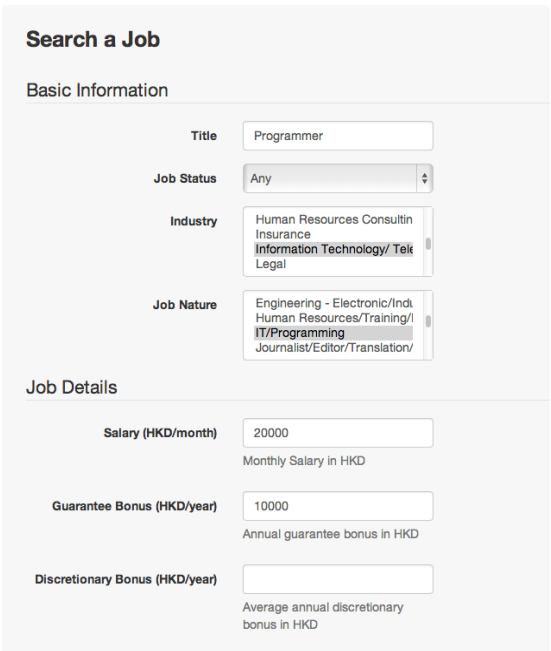


Register Page for Job Seeker

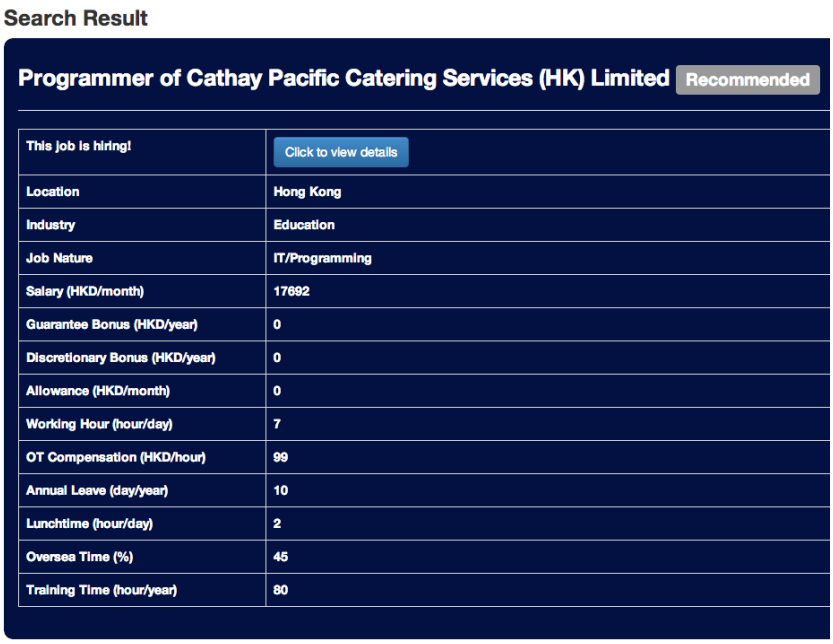


Post job opening (job ads)

Employees can review their current/previous job. When users register, they will be asked to give a review on their current job. First part of the review will be some basic information of the job. Second part of the review will ask for further details of this job. Employers can post job advertisement to provide the recruiting information of a job opening, including vacancy, application method etc.



Job Search Page



Search Result

Job seekers will provide their job searching criteria. The system will match the requests to jobs by using a matching algorithm and recommends available job openings to them.

List of parameters in a job review

1. Monthly Salary in HKD (10)
2. Annual guarantee bonus in HKD (10)
3. Average annual discretionary bonus in HKD (10)
4. Monthly allowance of any other kinds in HKD (8)
5. Average working hour per day (8)
6. Overtime working compensation in HKD per hour (5)
7. Days of annual leave in day per year (5)
8. Lunchtime in hours per working day (4)
9. Percentage of time spent on oversea work and business trip (2)
10. Annual training time in hours per year (2)

(From most to least important, number in bracket represents weight of parameters)

Algorithm

Content-based filtering will be used as the major algorithm. When a user submits a search request, the parameters provided will form a search vector, A. It will be normalized and then scaled with the corresponding weights. The search vector will then be compared to the job vectors, B, in the database and the similarity between these job vectors and the search vector will be calculated using cosine similarity as follows.

$$\text{similarity} = \cos(\theta) = \frac{A \cdot B}{\|A\|\|B\|} = \frac{\sum_{i=1}^{n} A_i \times B_i}{\sqrt{\sum_{i=1}^{n} (A_i)^2} \times \sqrt{\sum_{i=1}^{n} (B_i)^2}}$$

Evaluation

A case study style survey is designed to evaluate the effectiveness of the system, and 20 participants are asked to go through some case studies to understand the usage of JORES and compare the system with other job searching engines.