Career Path Recommendation System

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Recommendation systems are widely used on the internet to assist customers in finding the products or services that best fit with their individual preferences. Good match between persons and jobs needs to consider both, the preferences of the recruiter and the preferences of the candidate. Here, we are suggesting a career path of a person to acquire his/her goal. We present two way for suggesting a career path, one in which we read person's profile and suggest a path and in other one user enters his/her career goal and based on this we suggest a career path.

Additional Key Words and Phrases: Natural Language Processing, Latent Semantic Indexing, Career Recommendation

1. INTRODUCTION

Personalization system such as recommender system attracted the interest of many researcher and practitioners. Many techniques for suggestion of career path and job recommendation have been developed and applied. These includes the one of the possible approach for career path recommendation system.

1.1 Motivation

For college students, when facing various career options upon graduation, it could be overwhelming to choose a job that better fits with his/her future career goals. Also,for current employees, it could be unclear that whether changing a job or pursuing advanced study will help to reach his/her ambition. This is when people start to looking for other people who have similar backgrounds to see what were their decisions and where did they end up. Instead of consulting only a few persons, we present a way to help people learn from thousands of others with similar backgrounds, and nd best career steps that enable them to reach their goals.

1.2 Problem Definition

We are given a data having details of user's professional career. We need to design a module which first read user's profile a based on our data it suggests a career path in terms of skill set to be acquired. On other side, user enters a career goal and based on this career goal and other related information the module suggest a career path.

This project consists of various challenges. One of them is, how to convert descriptive information into feature. Also there are number of job position which describe the similar position, so we need to find a way to group the ones which describes similar position.

2. DATA PREPARATION

2.1 Data Collection

We obtained about 800 profiles from linkedin as our data source. Each profile contains work experience, education, skills and other additional information. As work experience, the raw data consists of person's current and past job designations, company and projects done by the person. Educational infor-

mation is break down into institute, school duration and qualification. Then, the data is pre-processed int the following way to obtain model which describe better nature of people's careers.

2.2 Data Pre-processing

The data is available in JSON format, which we need to convert into the format which is easy to manage. So, we first we make a dictionary of a skills, qualification, job designation, company base on our data. Before applying any algorithm we need to apply text semantic to our dictionary. Because there are different number of designation, skills, company name and method of writing them, which has same meaning. With the help of Latent Semantic Indexing we can put the words having same meaning together and make our feature dimension manageable. Latent Semantic Analysis is useful in this problem because it helps us to search by meaning rather than the content and it is also useful in natural language processing. Here, we assume that there is no data redundancy in the context of meaning and the value.
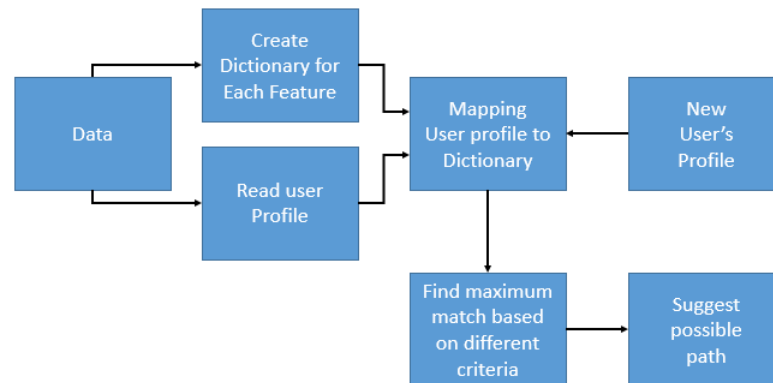
3. MODEL

Figure 1: Model for job recommendation system

3.1 Algorithm

ALGORITHM 1: Profile Matching Algorithm

$mathCount \leftarrow 0$
$userID \leftarrow$ -1
$max \leftarrow matchCount$
$userData \leftarrow$ get data of new user
for *each data in userData,* **do**
    $users \leftarrow$ get user for each data
    for *each user in users* **do**
        match $user$ to $newuser$
        if *match* **then**
            increment the $matchCount$
            update the max
            $userID \leftarrow user$
        end
    end
end
return skills of matched userID

In this algorithm, first we read the new user's profile and match this profile to our database and find the best match for that user. Whichever profile fits to the user we recommend skills of that matched profile to the user. Finding the best fit is taking $O(nm)$ time and suggesting the skills takes $O(1)$, where n = number of users and m = total length of a dictionary. so overall time complexity is $O(n^2)$. As we are mapping user's profile to our dictionary, the space require is number of feature x length of data x number of user. So, overall space complexity is $O(m * N * U)$, where m = number of features, N = size of the data and U = number of users.
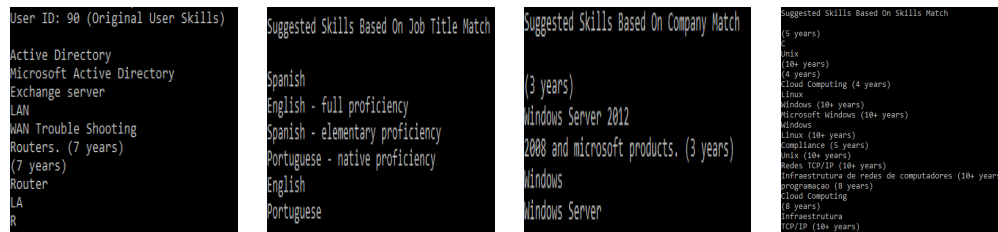
4. RESULTS

Figure 2: Results of original skills and suggested skills

5. CONCLUSION

Many reasons found into the lack of desirable result. First, the feature components are relevant to the career path module are difficult to automatically quantified and compared. Second, the raw data is represent in natural language format, and this adds an additional level of data pre-processing requirement.However, the accuracy of model is largely to be measured against human common sense, it is difcult to provide means of automatic result evaluation.

5.1 Future Work

As for the future work, we intend to first improve the data pre-processing technique which help to convert raw data in natural language format to some mathematical format. This include a better natural language processing algorithm for clustering job designation and degree.

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