A survey of job recommender systems

INTRODUCTION

like The fast growth of the Internet caused a matching growth of the amount of available online information that increased the need to expand the ability of users to manage all this information. This encourages a sub- stantial interest in specific research fields and techno- logies that could benefit the managing of this information overload. The most important fields are Information retrieval and Information filtering. Information retrieval deals with automatically matching user‟s information and Information filtering aims to assist users eliminating unwanted information (Hanani et al., 2001).[1]
The latest technology designed to fight information overload is the recommender systems that originated from cognitive science, approximation theory, information retrieval, forecasting theories and also related to management science and to consumer choice modeling in marketing (Adomavicius and Tuzhilin, 2005). The recommender systems used to determine the interested items for a specific user by employing a variety of information resources that is related to users and items.

In the mid-1990s, the term recommender system was published for the first time in information system literature (Resnick and Varian, 1997). Many researches in industry and academic areas have been known to develop new approaches for recommender systems in the last decade. The interest in this area still remains high because it is composed of a problem-rich research area and has a wealth of practical applications (Adomavicius and Tuzhilin, 2005). [2]

Recommender systems are being broadly accepted in various applications to suggest products, services, and information items to latent customers. Many e-commerce applications join recommender systems in order to expand customer services, increase selling rates and decrease customers search time (Schafer et al., 1999). For example, a wide range of companies such as the online book retailer Amazon.com (Linden et al., 2003), books (Mooney and Roy, 2000), and news articles (Das et al., 2007). Additionally, Microsoft provides users many recommendations such as the free download products, bug fixes and so forth (Shani and Gunawardana, 2011). All these companies have successfully set up commercial recommender systems and have increased web sales and improved customer fidelity. Moreover, many software
developers provide stand-alone generic recommendation technologies. The top providers include Net Perceptions, Epiphany, Art Technology Group, Broad Vision, and Blue Martini Software (Huang et al., 2007).[3]

For many years, information system supports in human resource management have been mainly restricted in storing and tracking applicants‟ data through the appli- cant management systems. These systems support the internal workflows and communication processes between the human resource management department and the other departments. Recently, the increased amount of digital information and the emergence of e- business reform the way companies conduct business in different aspects. Initially, simple solutions are applied such as posting the job ads on the career unit of the corporate website. Then, based on the experiences gained from these first implementations, the opportunities are realized, establishing other changes and hence, implementing enhanced e-recruitment platformsThe Internet-based online recruiting platform or e- recruitment platform is one of the most successful- business changes, which changed the way companies employ candidates.

portal, social media applications or a firm‟s career website have driven this development. While the companies established job positions on these portals, job-seeker uses them to publish their profiles.

For each posted job, thousands of resumes are received by companies. Consequently, a huge volume of job descrip- tions and candidate resumes are becoming available online.

This vast volume of information gives a great opportunity for enhancing the matching quality; this potential is unused since search functionality in recruiting applications is mainly restricted to Boolean search method. The need increases for applying the recom- mender system technologies that can help recruiters to handle this information efficiently (Färber et al., 2003; Yi et al., 2007). Many researches have been conducted to discuss different issues related to the recruiting problem as well as, the application of recommender system technologies. However, job recommendation is still a challenging domain and a growing area of research

In order to support this research area, we conduct a com- prehensive survey for job recommender systems. We will discuss the e-recruitment problem and present the state- of-art of solutions tailored to candidates/job matching.

ABSTRACT

From the last two decades internet based recruiting platforms have become a primary channel in most companies for recruiting talents. Such portals decrease the advertisement cost, but they suffer from information overload problem. Job portals using traditional information retrieval techniques such as Boolean search methods are typically using simple word matching algorithms. The main issue of these portals is their inability to understand the complexity of matching between candidates' desires and organizations' requirements. Hence, a vast amount of deserving candidates misses the opportunity to get an appropriate job. The recent recommender systems have achieved success in e-commerce applications. In order to improve the functionality of e-recruitment process, many recommendation systems approaches have been proposed. In this paper, we present a survey of existing recommendation approaches that have been used for building the personalized recommendation systems for job seekers as well as recruiters. Also we have identified the challenges in building a job recruitment system as compared to recommendation systems in other domain

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The Internet-based online recruiting platform or e- recruitment platform is one of the most successful- business changes, which changed the way companies employ candidates. These platforms spread in the recent years because the recruiting of the appropriate person is a challenge faced by most companies, as well as the unavailability of certain candidates in some skill areas has long been identified as a major obstacle to companies success (Laumer and Eckhardt, 2010).[4]
The online channels Internet job
portal, social media applications or a firm‟s career website have driven this development. While the Companies established job positions on these portals, job-seeker uses them to publish their profiles. For each posted job, thousands of resumes are received by companies. Consequently, a huge volume of job descrip- tions and candidate resumes are becoming available online.

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REVIEW OF LITERATURE ON RECOMMENDER SYSTEMS TECHNIQUES

Background of recommender systems

Recommender system: an information-filtering system supporting the user in a given decision making situation by narrowing the set of possible options and prioritizing its elements in a specific context. Prioritization can be based on the user's explicitly or implicitly expressed preferences and also on the previous behavior of users with similar preferences.

Collaborative filtering approach

Collaborative filtering is a technique that can filter out items that a user might like on the basis of
It works by searching a large group of people and finding a smaller set of users with tastes similar to a particular user. It looks at the items they like and combines them to create a ranked list of suggestions.

Memory-based CF methods

Memory-Based Collaborative Filtering approaches can be divided into two main sections: user-item filtering and item-item filtering. A **user-item filtering** takes a particular user, find users that are similar to that user based on similarity of ratings, and recommend items that those similar users liked. In contrast, **item-item filtering** will take an item, find users who liked that item, and find other items that those users or similar users also liked. It takes items and outputs other items as recommendations.

Model-based CF methods

In this approach, CF models are developed using machine learning algorithms to predict user's rating of unrated items. As per my understanding, the algorithms in this approach can further be broken down into 3 sub-types.

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