

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 7, Issue 12, December 2018

Intelligent Recommendation System Based on Behavioural Analysis Approach

Vinita S. Patil

Department of Computer Engineering, Pune Institute of Computer Technology, Pune, India

ABSTRACT:Information of major IT industries is made available to the candidates, using which candidate can select desired organization. An intelligent system is built so as to judge the candidate's current strengths and weaknesses in the context of industry requirement. Here, based on the past information of the candidate and current analysis proper suggestion is given to the candidate. This may enhance his chances of getting into the desired organization.

KEYWORDS: Machine learning, Recommender system, Supervised learning, Classification, Adaptive algorithm

I. INTRODUCTION

The scenario over the past few years in IT sector has dramatically changed. In the earlier years, IT organizations used to recruit more number of graduates, in anticipation of getting good number of development work. But, today this has become uncertain because the unpredictable scene in technology growth / development. Also, another important factor contributing this shift is due to imbalance in the supply-demands ratio. There are more challenges to the job seekers and also for industry to recruit candidates due to changing technologies. It is therefore required to have complete knowledge of technology and problem domain in which the particular organization works. There might be the need for skill upgradation. Candidates do not have exact knowledge of required skill by the organization and which of these skills need to be upgraded. This may reduce the opportunity of the candidate being selected for the job. This leads to basic requirement of proper and well guided information to the candidate. This will provide proper direction to the candidate in order to have fair chance of getting into dream organization.

A recommendation system which aims at providing personalised recommendation based on the candidates attributes such as basic knowledge, inclination to learn, studiousness and his back history. The proposed system consists of an adaptive algorithm used to create dynamic questionnaire which displays question at a time and based on candidates previous answers next question is given to judge his level. Fuzzy rule based classifier is used for classification and proper recommendation. The recommendation as in upgradation of the skills and / or learning new technologies and / or improvement in analytical and logical reasoning, is the outcome of the proposed system. As the proposed system is taking many parameters along with academic performance the system is expected to provide more accurate suggestions.

An adaptive algorithm is an algorithm that changes its actions at run time, based on information available and on a priori defined reward mechanism or some criteria. In machine learning and optimization, many algorithms are adaptive or have adaptive variants which usually means that the algorithm parameters are automatically adjusted according to the gained statistics at that instance.

Fuzzy classification is the process of grouping elements together into a fuzzy set whose membership function is defines by the truth value of a fuzzy propositional function.. It is the process of grouping individuals having the same characteristics into a fuzzy set. A fuzzy classification corresponds to a membership function which indicates whether an individual is a member of a class, given its fuzzy classification predicate.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 7, Issue 12, December 2018

The term rule based classification can be used to refer to any classification scheme that make use of IF-THEN rules for class prediction. The IF part is known as the condition and the THEN part is known as conclusion. There could be many rules based on the system requirement. There is the One Rule Algorithm where each value of the attribute is a part of some particular class. There could also be many attributes considered at a time. But the rules to be selected should have convergence as well as accuracy.

II. LITERATURE SURVEY

Literature survey is the most important step in any kind of research. Before start developing we need to study the previous papers of our domain which we are working and on the basis of study we can predict or generate the drawback and start working with the reference of previous papers.

In this section, we briefly review the related work on Recommendation system and their different techniques.

A learning style questionnaire was presented to the students. Based on the results using Felder-Silverman learning style model, individual learning style of the student was predicted by authors S. Graf, Kinshuk, Tzu-Chien Liu, in the paper "Identifying Learning Styles in Learning Management Systems by Using Indications from Students' Behaviour" [2]. In this Rule based mechanism was used with some limitations such as only specific learning styles were considered.

In the paper "Advanced Adaptivity in Learning Management Systems by Considering Learning Styles" by authors S. Graf and Kinshuk [3] adaptive learning mechanism which provides students with courses that best fit their individual learning style was provided where the technique Adaptive generic mechanism is used where constant track has to be maintained as the learning style of students changes.

Authors Y. Li and Z. Wang used Fuzzy sets to represent students' knowledge level and to dynamically update user stereotypes in the paper "Adaptive reinforcement Q-Learning algorithm for swarm-robot system using pheromone mechanism" [4]. Fuzzy Knowledge State Definer technique is used but here the change in the performance is dependent only on the systems elements.

Records of jobs are learned to establish user demand models such as job-resume matching model is achieved by authors Z. Wang and X. Tang in the paper "A Resume Recommendation Model for Online Recruitment" [6]. Genetic algorithm technique is used but performance and interest of the candidate are not considered.

In the paper "User Behavior Analysis and Commodity Recommendation for Point-Earning Apps" by authors Y. C. Chen, C. C. Yang, Y. J. Liao, C. H. Chang [7], several methods including a traditional classifier, heuristic scoring, and machine learning to build a recommendation system and integrate content-based collaborative filtering for a hybrid recommendation system using Co-Clustering with Augmented Matrices (CCAM) are used. Crawler is used to acquire regular customers' purchasing information, which can help to enhance prediction performance. The recommendation is done based only on user consumption and other factors such as time, region are not considered.

III. EXISTING APPROACH

Lot of work has been done in this field because of its extensive usage and applications. In this section, some of the approaches which have been implemented to achieve the same purpose are mentioned. These works are majorly differentiated by the algorithm for recommendation systems.

As my point of view when I studied the papers the issues are related to recommendation systems. The challenge is to addressing cold start problem from implicit feedback is based on the detection of recommendation between users and companys with similar preference.

IV. PROPOSED APPROACH

The Fig 1, shows system architecture of proposed system. In proposed work input is taken in form of text content. This collected data is then processed to get candidates knowledge and behavioural information. An adaptive questionnaire is

International Journal of Innovative Research in Science, Engineering and Technology

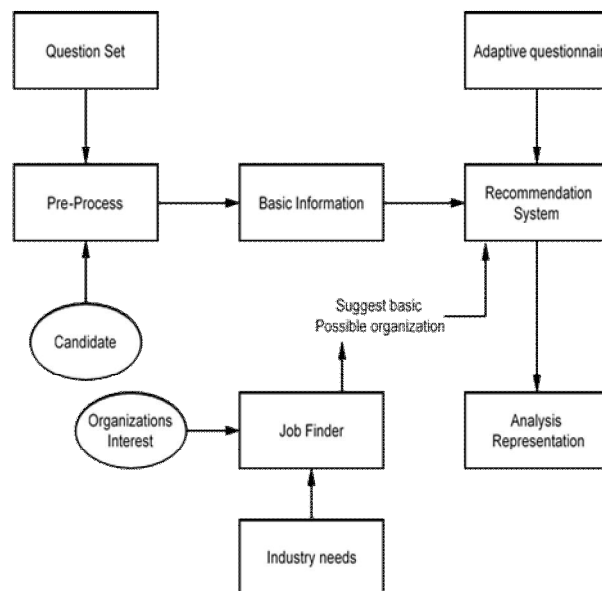
(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 7, Issue 12, December 2018

presented to the candidates. Based on the candidates answer next question is prompted to find out the knowledge of candidate in that particular field. Based on candidates performance on questionnaire and his behaviour list is made of the skills the candidate needs to work on. This list is presented to the candidate in form of recommendation.

System Architecture:



A. Algorithm

ADAPTIVE ALGORITHM

Input: 25 questions each for the selected domain.
Output: Single question appears on the page based on previous answers.

```

Call the function GetQuestions(user_ID, domain_ID, domain_level, domain_marks)
Initialize domain to current session domain
Initialize question_level_easy to current session question_level_easy
Initialize question_level_medium to current session question_level_medium
Initialize question_level_hard to current session question_level_hard
Initialize domain_marks to current session domain_marks
For all the selected domains
domain_marks (domain_ID) = domain_marks + marks
domain_question_level (domain_ID) = question_level
if question_level equal to 0
question_level = question_level_easy
else if question_level equal to question_level_easy
{
if marks > 0

```

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 7, Issue 12, December 2018

```
question_level = question_level_medium
else
question_level = question_level_easy
}
else if question_level equal to question_level_medium
{
if marks > 0
question_level = question_level_hard
else
question_level = question_level_medium
}
else if question_level equal to question_level_hard
{
if marks > 0
question_level = question_level_hard
else
question_level = question_level_medium
}
Get user_ID, domain_ID, domain_question_level, domain_marks
```

B. Comparison Graph:

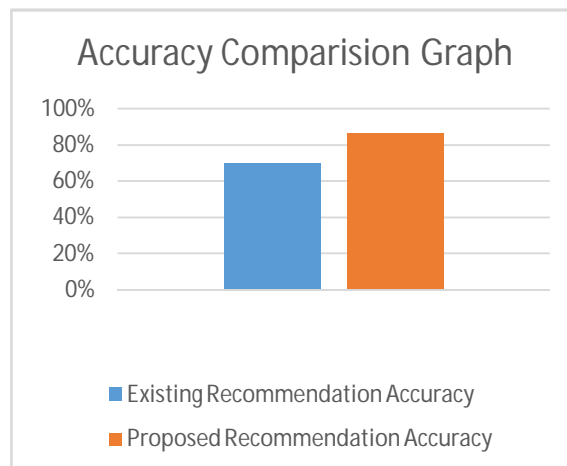


Fig 2. Graph

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 7, Issue 12, December 2018

C. Comparison Table:

Sr.No	Existing Method Result	Proposed Method Result
1	68%	84%

Table 1.comparative result

V. CONCLUSION

Many systems which are used for the recommendation purpose are sometimes complicated and confusing. Hence we develop a system that is easy to understand and gives quick and accurate results. In this system we use two algorithms for recommending the candidate as which area he needs to work on and improve his skills. The algorithm produces adaptive questionnaire which is based on candidate behavior for personal and individual assessment and improve precision and accuracy of recommendation.

REFERENCES

- [1] P. Montuschi, F. Lamberti, "A Semantic Recommender System for Adaptive Learning", 2015, IEEE, pp. 50-58.
- [2] S. Graf, Kinshuk, Tzu-Chien Liu, "Identifying Learning Styles in Learning Management Systems by Using Indications from Students' Behaviour", 2008, IEEE, pp. 1-5.
- [3] S. Graf and Kinshuk, "Advanced Adaptivity in Learning Management Systems by Considering Learning Styles", 2009, IEEE, pp. 235-238.
- [4] Y. Li; Z. Wang, "Adaptive reinforcement Q-Learning algorithm for swarm-robot system using pheromone mechanism", 2013, IEEE, pp. 952 – 957.
- [5] K. Chrysafiadi, M. Virvou, "Fuzzy Logic for adaptive instruction in an e-learning environment for computer programming", 2014, IEEE, pp. 1-21.
- [6] Z. Wang , X. Tang, "AResume Recommendation Model for Online Recruitment", 2015, IEEE, pp. 256-259.
- [7] Y. C. Chen, C. C. Yang, Y. J. Liau, C. H. Chang, "User Behavior Analysis and Commodity Recommendation for Point-Earning Apps", 2016, IEEE, pp. 170-177.
- [8] G. F. Ming, "Course-Scheduling Algorithm of Option-based Hierarchical Reinforcement Learning", 2010, IEEE, pp. 288-291.
- [9] I. Portugal, P. Alencar, D. Cowan, "The Use of Machine Learning Algorithms in Recommender Systems: A Systematic Review", Expert Systems With Applications (2017), pp. 1-30.
- [10] F. Sarro, F. Ferrucci, M. Harman, "Adaptive Multi-objective Evolutionary Algorithms for Overtime Planning in Software Projects", 2017, IEEE, pp. 1-21.