A Hypothesis is Placed to Justify the Extendibility of Recommender System/ Recommendation System into Social Life

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ABSTRACT

Researchers still believe that the information filtering system/ collaborating system is a recommender system or a recommendation system. It is used to predict the "rating" or "preference" of a user to an item. In other words, both predict rating or preference for an item or product on a specific platform. The aim of the paper is to extend the areas of the recommender system/recommendation systems. The basic task of the recommender system mainly is to predict or analyze items/product. If it is possible to include more products in the system, then obviously the system may be extended for other areas also. For example, Medicine is a product and doctors filter the particular medicine for the particular disease. In the medical diagnosis doctors prescribed a medicine and it a product. It depends on the disease of the user/patient so here doctor predicts a medicine or product just like an item is recommended in a recommender system. The main objective of the paper is to extend the Recommender System/Recommendation system in other fields so that the research works can be extended Social Science, Bio-medical Science and many other areas.

Keywords: Item, Medicine, Product, Medical Application, Financial Application, Recommender System, Machine Learning

I. INTRODUCTION

Recommender/Recommendation systems are designed in an efficient way that analyses the significant dependencies between user and item-centric activity. The entity to which the recommendation is provided is referred to as the user, and the product being recommended is referred as an item. Therefore, recommendation analysis is often based on the previous interaction between users and items, because past interests and proclivities are often good indicators of future choices. Many of these recommender systems are applied on traditional e-commerce applications for various products, including books, movies, videos, travel, and other goods and services [1]. It can be extended further in other applications since the recommender/recommendation systems predict as per the definition of the system. In daily life we are hearing different terms and some of them can be used as items. For example, medicine is an item or product. During investigation of a disease of a patient there is a prediction of medicine for the disease. It is only possible after hearing the history of disease. From the dataset/knowledge set of a doctor, he/she is predicting a medicine i.e. a product to the best of his/her knowledge. There may be the possibility that the medicine may change in future since it may give better results than the previous medicine. So the diagnosis of medical disease may require some prediction that belongs to the recommender/recommendation system. In case of any product selection, it is always required to analyze the best product out of a number of products. Users do not select/predict an item which is looking like another established product since it may be the product of not established band. Consider the case when we see a job advertisement then it is required to know whether we are looking for a perfect job. In other words, we are actually looking for a good product. In this paper we presented different types of the recommender/recommendation system other than conventional.

II. RELATED WORKS

The recommender systems deal with two kinds of data, which are (i) the user-item interactions, such as ratings or buying behavior, and (ii) the attribute information about the users and items such as textual profiles or relevant keywords. The former is referred to as collaborative filtering methods and the latter are referred to as content-based recommender methods [2-3]. The content-based systems use the ratings matrices in most cases and it is usually focused on the ratings of a single user rather than all users. The recommendation systems based on knowledge base are based on explicitly specified user requirements. All recommender systems are used either to predict or recommend. A recommender system with two or more methods is called a Hybrid system [4-5]. It can combine the strengths of various types of recommender systems to create techniques to make the system more robust. Consider an example of analysis of human behavior of a person in some situation by another person. This is nothing but the prediction of the situation created by the environment. So analysis of human behavior is also termed as the recommender system/recommendation system. Numerous studies [6-7] have been carried out for designing recommender systems on various domains. All these study focused on

analyzing user and item interactions for acquiring relevant suggestions.

III.   PROPOSED HYPOTHESIS

Use of either or both collaborative filtering and content-based filtering for predicting related appropriate items, is a traditional way of designing recommender systems as believed by researchers. In this paper the approach is to justify through hypothesis that the recommender system and recommendation system are same and both can be used for prediction of item/medicine/state of human/disease.

A hypothesis is to show the occurrence of the fact or situation by showing the fact or situation that happened but cannot be proved. In this case we predict that the recommender system can be extended for other applications if such situation approves the basic concepts of the recommender system. We assume that the analysis of human behavior is not a recommender system. In principle, it actually predicts/recommends the human attitude and it proves the basic definition of the recommender system. Hence the hypothesis is proved.

The purpose of this paper is to establish the fact that instead of inferring predictions for items such as books, movies, videos etc.; it may even be extended to other applications such as medical diagnosis, financial sectors, human behavior analysis and many more.

3.1 Recommender System in Medical Field

Decision is also one type of prediction and for example, in the medical system the proper decision is required for diagnosis of disease. The doctor initially predicts or makes a decision about the disease of the patient. In the medical system the term rating is used as the stage of the disease. Doctor uses a preference of medicine, a product, for a particular disease and this preference of medicine may produce the best diagnosis of a patient.

3.2 Recommender System in Financial Field

In the case of financial sectors, we consider the scenario of banking sectors. In this context, analyzing the dependencies between customer (user) and term-deposit (item) may be recommended to the bank. Hence likelihood of term deposit subscription prediction may help the bank to make informed decisions in order to attract more customers.

Financial transaction systems can be incorporated with a recommender tool that will automatically perceive the financial fraud transactions and alert the customers (user). The financial transactions are items that need to be detected for fraudulent activity reduction.

Considering another scenario of the stock market, the concept of recommended system may be applied. Here, the price of stock can be considered as an item which needs to be predicted. The investors in this case are the users. However, the price of stock products may be perturbed by the impact of other influential

attributes such as present socio-economic conditions, company status and so on.

3.3 Recommender System in Human Behavior Analysis

The concept of recommender systems can even be applied to assessing human behavior analysis tasks. Again, the interdependencies between human (user) and its behavior (item) need to be analyzed. In some scenarios, mental anxiety, depression prediction may be predicted as sub-items of 'human behavior' item.

3.4 Recommender System in Social Context

To serve the social welfare, the use of recommender systems may be investigated. For assessing the probabilities of campus placement for an educational organization, campus placement may be perceived as a service. The relation between student (user) and their campus placement (item) can be utilized as a recommendation system problem. Application of recommender system can be extended in the field of transport service system. Early prediction of Aircraft cancellation events can be considered as an item that benefits passengers (users) to take alternative decisions.

For the traditional recommender system, machine learning based algorithms such as collaborative filtering and/or content based filtering are main methods that provide relevant suggestions to the users. Apart from implementing and applying these systems on various domains, we can even use other machine learning (ML) based algorithms such as Support Vector Machine (SVM), Bayesian models, decision tree models, other ensemble models for acquiring such predictions. In this proposed hypothesis, predictive modeling is basically observed from the recommender system point of view. ML techniques can easily extract the underlying relationship among the interfering factors that can perturb the prediction of any items. As mentioned in the aforementioned examples, application of other ML techniques needs to be applied in order to extend the idea of traditional recommender systems.

IV.   CONCLUSIONS

This paper establishes the fact that the application of the recommender system can be extended in various fields while relating the concepts of customers and items. Apart from implementing ML based algorithms such as collaborative filtering, content based filtering; this study suggests investigating other data mining techniques those are not in practice. Use of ML techniques is exploited for predictive modeling for designing the recommender system. ML is used here since it has been training something and then classifying it. Suppose you are within a big garden with another person who has knowledge of flowers. The person has actually trained you so that you can classify the particular flower. In the market this flower is a product that is sold in a flower shop. Here flowers are a product so the recommender system can analyze the financial part of how many flowers are sold. Apart from this mentioned

scenario, this application of recommender systems can be even applied in other domains. This paper provides an innovative idea of extending this recommender system in many scenarios for achieving best prediction results.

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