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A Study on Requirements and Characterization of Recommender System for Social Network

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Abstract: Today most of the business and the social interaction is done through the web based social networks. To improve the online sales and to improve the product reach, online markets and networks are using the concept of recommender system. The recommender system is the automated system that observes the user requirement, behavior and the interest and recognizes the hidden pattern. Based on this pattern or the interest, some product or the service is suggested to the user. In this paper, the basic characterization and the requirement of recommender system is explored. The paper has characterize the basic associated terms as well as explored the types and functioning of recommender system.

Keywords: Recommender System, Requirements, Characterization, Collaborative

I. INTRODUCTION

The recommendation system is actually implemented by using two main approach classes called the content based filtering and the collaborative filtering. These two approaches having their advantages and disadvantages. The hybrid recommendation system actually combines these two approaches and minimizes the advantages of these two systems. There are number of approaches to perform the recommendation. These approaches are includes the demographic recommender, Utility based recommender and the knowledge based recommender. These recommendation approaches are defined under the data mining approaches[1][2][3][4]. The process stages associated to the recommendation system are discussed in this section.

A) Collaborative Filtering

The collaborative filtering is the process that process on user feedback available in the form of rating under the domain specification. This process includes the similarity analysis to estimate the rating behavior and to identify the recommendation of the product. The collaborative filtering system is based on the user analysis to perform the recommendation. The prediction by the collaborative filtering is effective because it identifies the mind similarity between users and performs the recommendation based on this kind of analysis[5][6][7][8].

A) Collaborative Filtering Process

The basic process of the collaborative filtering[4][5][6] is about to predict the user rating respective to the defined item. The user input user has not defined any rating. The system perform the user level analysis and identity the similar user to perform the recommendation

- Recommendation is also called user-tem analysis under the acceptivity vector so that that the preference scores will be identified. The score estimation is performed for each ith user for jth item. The obtained rating is defined in the form of nominal values.

- The filter includes the estimation or the prediction of the items under the statistical analysis. This approach is the relational analysis between the items and the users under different approaches to perform the recommendation. The problem set is defined for K users and based on the user analysis the items can be identified effectively.

- Once the similarity values are obtained, the next work is perform the prediction or the recommendation based on the analysis.

- Prediction is estimated for the ith user for the jth item. The predicted value is based on all user value analysis.

- The recommendation is performed on the group of N items so that the recommendation will be performed on N items

II. EXISTING WORK

Lot of work is provided by different researchers to achieve the effective and adaptive recommendation for different applications. In this section, the contribution of different researchers is provided. Author[1] has defined a study based work to identify the possible extensions to the next generation recommendation. The user type and the application area based study were provided by the author. The restrictions and limitations of different recommender systems were also identified by the author. Identification to the hidden limitation and the extensive usage of recommender system was provided by the author. Author[2] has identified different aspects of recommender system and provided a collaborative mapping to explore the issues and the concept of collaborative filtering. The scalability based issue analysis was provided to achieve the effective recommendation. Author[3] has defined a new approach to observe the college level analysis to generate the behavior observation and provided by the author. The contextual feature mapping collective form was defined by the author and provided the effective and accurate information processing. Author[4] has defined a work on item driven analysis and in relation to the user based recommendation. The dynamic information processing method has identified the similarity at different level and relatively provided an improved recommender system. A work on item specific similarity analysis was provided by Author[5] using collaborative recommender system. The user driven static recommender was provided with dynamic feature mapping so that the improvement to the recommender system will be obtained from the work.

Author[6] has defined an extension to the rating and information analysis. The evidence level analysis with sparsely problem observation was provided. The dual similarity observation was provided at user level and at item level. The attribute and rating processing in effect of mean has provided the effective recommendation. Author[7] has defined a work on different algorithmic methods to provide the performance driven analysis to achieve the effective

recommendation. The data level and item level analysis was provided in collective form by the author to improve the recommendation results. Author[8] has defined a content based recommender with descriptive information processing. The content information analysis with relative information processing was provided to identify the problem identification in the relative form. The source specific analysis was provided by the author. Author[9] has defined the recommender system based on the unified information processing. The source specific information was processed with specification of rate information content driven information and the data unification. Author[10] has defined a work on parameter adaptive prediction and provided the rate information processing and unification. The parameter adaptive prediction was provided by the author. Author[11] has used the trustworthiness based recommender system to process the real and effective information. The filtration stage was applied to discard the unrequired and unmapped information. The information processing was here defined to achieve the accurate recommendation.

Author[12] has provided the work on the user level analysis and processed the knowledge set in different form and generated the standardized rating to improve the recommendation based on the algorithmic approach. The accurate information processing was provided to test the users relative to the information and defined an effective knowledge test to provide the accurate recommendation. Author[13] has defined a standardize rating method to estimate and calculate the work behavior of recommender data processing. The robust and effective data processing was provided by the author. The cluster adaptive method was provided to explore the descriptive information and defined the data information processing and transformation. Author[14] has provided an integrated data processing based on the feature weight analysis. The content specific recommender was provided with weight assignment for different features. The movie weight method was provided along with linear regression method to achieve adaptive recommendation. Author[15] has defined a work on dimension reduction based sparsely problem resolution to achieve the effective recommendation. The user rating based analysis was provided by the author to form the cluster and provided the semantic analysis on user to item mapping. The predictive results based on the useful information processing were provided by the author.

III. RECOMMENDER SYSTEM CHARACTERIZATION

Recommendations[1][4][6][8][10][12][15][16] are having its importance in every area of life. It requires the external knowledge to perform the effective decision making and to construct the effective generation of the user interest analysis. The global user identification under different features, will be used for the effective recommendation. The automation process of this recommendation is defined under the artifact of interest. The recommendation system is defined as the rating system or the preference or priority evaluation system for some product or the service such as the book interest analysis, movie interest identification etc. These recommendation systems are generally specific to the application for which the recommendation is considered. The recommendation system is the subclass of information filtration system that actually performs the feature analysis under different feature elements. The recommendation system will also improve the sale of a service or the product provider. The recommendation analysis is done under two main requirements one is the characteristic analysis of the product or item and second is the social environment analysis of user. The first one actually defined as the content based analysis and second is called collaborative analysis. Recommendation system is considered as the intelligent system that can suggest the interest items to the user. The terms associated with recommendation system are explained in this section. Some of the common characterizations and the requirements for effective recommendation in social network are listed here under relative to the recommendation model

A) Item

An item can be a product or service or the object that is actually posses for the recommendation. In the social network, the item can be some product, service or the social media product. The actual recommendation system is based to increase the productivity or the sale of that particular item. The item can be a electronic document or some other real time object or service.

B) Recommender

The recommender is considered as the entity or the person or the user to perform the personalized recommendation. The recommendation is considered effective under the user preference analysis. Recommender can be an actual product or service user that recommends the product or service based on his personal experience.

C) Recommendation

It is the process of actually performing the recommendation of item for the user. This process is based on the characteristic analysis. The interest analysis performed in this recommendation process. The actual criteria to identify the user interest analysis on the particular item so that the user dependent recommendation will be performed.

D) User's Interest

The interest is considered as the preference of the user for particular product or the service. The interest is the actual appreciation of the user to the product.

E) Prediction

The prediction is about to perform the analysis on user interest so that the expected interest analysis will be performed. The recommendation analysis itself processes the prediction so that the actual decision will be drawn from the system.

F) Process Level Recommendation

The recommendation system is generally integrated with some application so that the class based or the rank based identification will be done. The analysis is performed on the item set as well as on the user set. The basic definition of the recommender system is given here under

- A set of users is defined and represented by U.
- A set of items represented by I
- The acceptability Function A that will measure the usefulness of item $i \in I$ and $u \in U$. The acceptability function is given as under

$$A : U \times I \rightarrow S$$

Here S represents the ordered set.

The S is the generally item group that can have large number of items defined in the list so that actual recommendation process will be performed. Such as, when we consider the recommendation system on books, a variety of books are available. The similarity analysis also implemented on the user group to identify the effective user. Later on the analysis on the item respective to the user is performed. This function is based on the characteristic analysis so that it is called the acceptability function.

IV. CONCLUSION

Recommender system is one of the common web behavior common in social network to identify the user interest and requirement based on behavior pattern analysis. In this paper, the common functioning, requirement and characterization of recommender system is described.

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