IOSR Journal of Computer Engineering (IOSR-JCE)
e-ISSN: 2278-0661,p-ISSN: 2278-8727, Volume 16, Issue 6, Ver. VII (Nov – Dec. 2014), PP 68-72
www.iosrjournals.org

Data Mining: Solving the Thirst of Recommendations to Users

S.Vaishnavi[1], M.Shobana[2], N.Geethanjali[3], Dr.S.Karthik[4]
[1]*Assistant Professor, Department of CSE, SNS College of Technology, Coimbatore*
[2]*Assistant Professor, Department of CSE, SNS College of Technology, Coimbatore*
[3]*Assistant Professor, Department of CSE, SNS College of Technology, Coimbatore*
[4]*Professor&Dean, Department of CSE, SNS College of Technology, Coimbatore*

***Abstract*:** *Internet usage attains a peek level in these days. It is portable due to arrival of smart phones. People can enquire information about any products they are in need using the Electronic sites. Their needs are satisfied by many sites now-a-days. This paper talks about the recommender system which gives useful information to users to assist them in finding what they are in need. In this process, data mining techniques can be used to find best recommendations. Association rule mining, classification, clustering is used here which give good personalized ideas.*

***Key words*:** *Recommender System, social networks, Data mining, Association rule mining, Classification, Clustering*

I. Introduction

With the fast growing internet usage increase and development in the world, searching (or) finding the relevant information has become a tedious thing to do. It is difficult for humans to do it manually. Day-by-Day, aim to get thought-provoking knowledge is increasing among internet users [1]. This paves way for the "recommendations" by others. Recommendations can be done orally (i.e., by oral suggestions by friends, neighbors etc) or electronically through internet (i.e., by getting suggestions from third party people where they have posted through internet). All the recommendations given by anyone should be trust-worthy, valuable and useful.

These recommendations give ideas to the users to choose the best product or item of their interest. System doing this kind of recommendation process is called "Recommender System". Recommendations have become on-line now-a-days. Recommender System is an active information filtering system that attempt to present to user, information about item such as films, music, books, webpage, etc., to which user is interested in[11].

II. Thirsts To Recommendations

Humans are carving for worthy and popular products. People use recommendations for their all kinds of purchases. E-Commerce or E-Marketing has attained a great success by attracting customers by giving fruitful suggestions. Some of the websites are Amazon.com, Movielens.com, and Netflix.com etc. These sites help in sales of products. Due to this, customers enjoy shopping from their home. Customers approach those websites to get products to which they are more interested. All categories of products can be found. [11]

In this decade, most people have their smart phones with an internet connection. So they easily get suggestions through their mobile phones, ipad and tablet etc.

2.1 Qualities Of Recommendations

A good recommendation engine should have the below properties:

- Accurate
- Diverse
- Persistence
- Privacy
- Robust
- Trust Worthy

III. Approaches In Recommendations

Recommendations can be user centric in which recommendations is based on past customer purchases and item centric, in which items are associated by linking one product with another [9]. Also approaches like content-based, collaborative filtering and hybrid recommender systems are used. In content-based, items that are purchased by customers are related, in collaborative filtering, user's similarity is calculated and hybrid is combination of both.

IV. Fields Where Recommendations Needed

4.1Electronic Sectors

World is growing faster than before decades. People need to reach their goals. This thirst leads them to get fruitful, true suggestions. People apply this in their life to get personalized recommendations. Sectors involving electronic shopping are E-Business, E-Learning, and E-Commerce. Recommendation engine is needed for the owners because need to attract their users by providing attractive facilities.

E-Commerce plays an indispensable role in online shopping. Some sites are Movielens.com, Amazon.com, Netflix.com, eBay.com, Jabong.com, playstore.com etc. They adopt the recommendation engines to satisfy their customers and improve their business profits.[recommend in E-commerce]

4.2 Social Networks

Social networks connect various groups of people with the motto to make resource sharing among them. It gives an opportunity to make people know about others and meet new people and friends in their own [16]. It gives chance to communicate with diverse communities of people across the world.

In these networks task of finding same interest of people is a difficult task. This can be done by recommender systems. Collaborative Filtering techniques are mostly adopted for giving recommendations in social networks [14].

V. Significance Of Data Mining In Personalized Recommendations

Data mining extracts useful patterns from the database or data warehouse. Main areas of data mining are Association Rule Mining, Classification, Clustering and Prediction. [3]
Association Rule Mining- This finds relationship between the items or products or any entities.
Classification- This creates a classifier model to classify the dataset.
Clustering- This aims to group the items according to its characteristics.
Prediction-Finding the relationship between a thing that already known and the thing that need to be predicted.
Using the above techniques, relationship between different items can be found easily.

VI. Recommendation Engine-Architecture

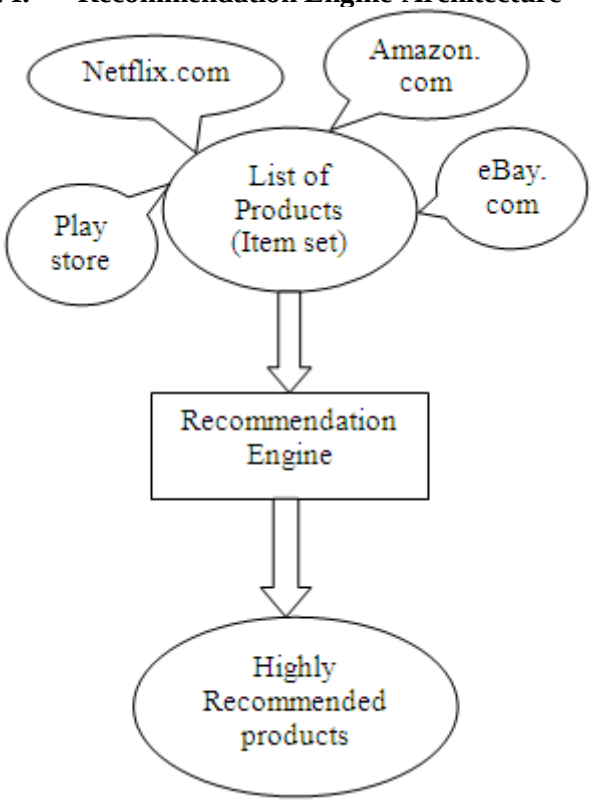

Fig 1 Architectural Framework Of Recommendation Engine

Figure 1 is a simple framework for the process of recommendation. Web sites will provide a broad category of items in huge number. Every time customer searches a thing in the website, his occurrence is recorded. Recommendation engine uses different approaches such as content-based, Collaborative Filtering and

Hybrid technique and produce highly recommended products to users. User's similar purchasing taste is found or item similarity can be used.

VII. Movie Recommending Sites

In the recommender system to get personalized ideas all the items should be traced for its properties i.e. when the item is established in the website, item name, item id, price and the discount price (at sometimes). Following web sites have been considered for the analysis of giving recommendations for the movies:

1. movielens.com[13]
2. sugestmemovie.com
3. jinni.com
4. agoodmovietowatch.com
5. whichmovietowatch.com
6. Netflix.com

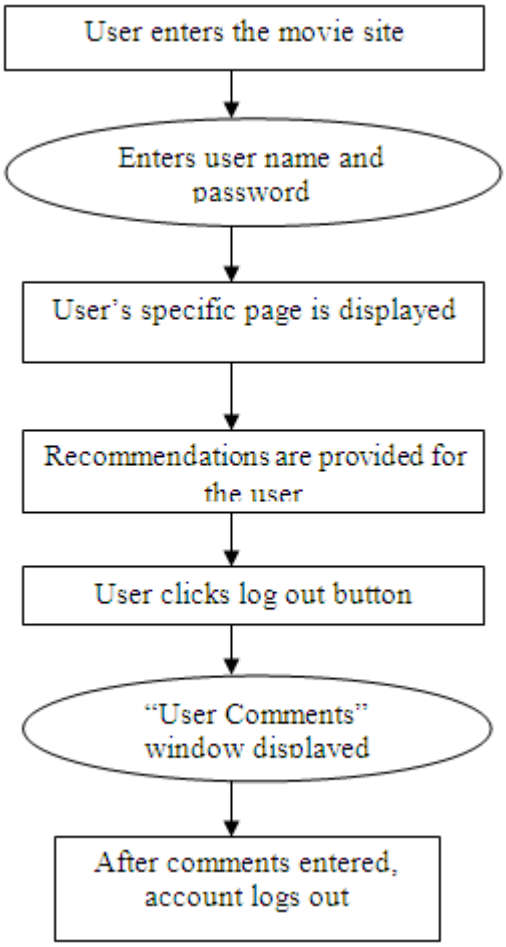

Fig 2 Personalization Process

Each site gives the movies which are more popular or recently released with customer reviews about the film. Some sites give the personalized ideas about the TV shows in channels. Movies are chosen as example product here. Figure 2 shows the process of how personalization takes place

When the customer logins the web site, recommendations are provided based on the past visits. Data mining techniques (Section 1.8) are used to give the recommendations. If the customer logs out, a window of user comments is displayed. It contains the list of movies the user visited in the current log in. It is taken as a feedback. In future transactions, information about movie is displayed with the comments.

VIII. Personalization Using Data Mining

Idea is to use the popular techniques of data mining to give good recommendations. Three techniques such as association rule mining, classification; clustering and prediction are to be used.

8.1 Association Rule Mining

It finds the relationship between the items or products (e.g., movies). Amount of one movie related with another movie is calculated [3]. The most popular association rule mining algorithm "Frequent Pattern Growth algorithm" is chosen. It has no candidate generation so it occupies less memory.
At the end of this mining, frequent movie seen by the user can be found.

8.2 Classification

It is the process of classifying the item set based on some conditions. There are many categories of movies which persons of different ages will like such as persons of age>65 will like devotional movies. "Decision tree classifier" created a classifier model to know to which category a movie belongs to.

On creating such a classifier model, persons approaching the recommendations can be easily given good recommendations. Using a classifier model and finding the suggestions for a user is done through "Prediction".

8.3 Clustering

For a specific user his most interested movies can be clustered. Each movie is considered as an object and the movie which user has liked or rated or downloaded or seen trailer are brought to his cluster where the similarity between each object is more.

IX. Example- Analysis

Let us consider an example of transactions which contains the list of movies of user. Each movie in the transaction has been
T1:M1, M2, M3
T2:M2, M3, M4
T3:M1, M4
T4:M1, M2, M5
T5:M1, M4
On applying the FP tree algorithm we get the following tree:

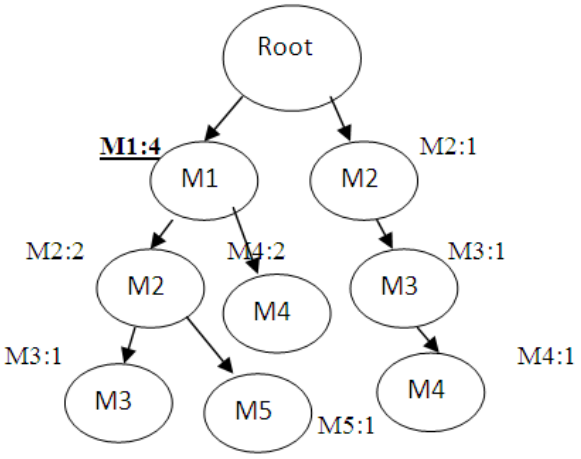

Fig 3. FP Growth Tree

From the tree given in figure 3, it is clear that Movie1 (M1) is most frequently seen by the user in his/her transactions and next most seen movie is M2. From this it is seen that person seen M1 has also seen M2 more times.

Classification can be done by gathering the user's details i.e., user's profile. For example, if the person is youth, he/she can be provided with action, comedy, documentary, horror, science and fiction, mystery, romantic movies; if person is middle aged he can be suggested horror, science and fiction, comedy movies.
Using above ways it is efficient to give recommendations to the users.

X. Conclusion

An efficient recommender system should satisfy the user's needs. Many sites increase their sale by establishing their products in the sites and giving personalized views of interest to user. In this paper, data mining techniques [3] has been used. An advantage of using FP growth algorithm is it consumes less memory as there is no candidate generation, less I/O and computational cost. "User comments "window will have the user's

views can be gathered. This can be used to give one user's reviews to others to give knowledge about the movies. On using these techniques, an efficient and incredible recommendation to users.

References

[1]. G. Adomavicius and A. Tuzhilin, "Toward the Next Generation of Recommender Systems: A Survey of the State-of-the-Art and Possible Extensions," IEEE Trans. Knowledge and Data Eng., vol. 17, no. 6, pp. 734-749, June 2005.

[2]. Sotiris Kotsiantis, Dimitris Kanellopouios "Association Rules Mining: A Recent Overview" GESTS International Transactions on Computer Science and Engineering, Vol.32 (1),2006.

[3]. Walter Alberto Aldana, " Data Mining Industry: Emerging Trends and New Opportunities", May 2000.

[4]. E.W.T. Ngai, Li Xiu andD.C.K. Chau, "Application of data mining techniques in customer relationship management: A literature review and classification" Department of Management and Marketing, The Hong Kong Polytechnic University, Hong Kong, PR China, Department of Automation, Tsinghua University, Beijing, PR China.

[5]. J. Ben Schafer,The Application of Data-Mining to Recommender Systems (Encyclopedia of Data Warehousing and Mining, Second Edition, 2009).

[6]. P.T. Joseph, E-Commerce book (Prentice Hall of India-New Delhi, 2009).

[7]. Ricci.F, Rokach.L, Recommender systems handbook (Springer, 1st edition, 2011).

[8]. S.Vaishnavi, Dr.S.Karthik, "Design of Recommender System Based on Customer Reviews" International Journal of Research in Engineering and Technology, Volume: 02 Issue: 11, Nov-2013

[9]. Neal Leavitt , "A Technology that Comes Highly Recommended" IEEE Computer Society 2013

[10]. Greg Linden, Brent Smith, and Jeremy York, "Amazon.com Recommendations Item-to-Item Collaborative Filtering" IEEE Computer Society, 2003

[11]. S.Vaishnavi, " Ranking Technique to Improve Diversity in Recommender Systems" International Journal of Computer Applications (0975 – 8887) Volume 68– No.2, April 2013.

[12]. Ana Belén Barragáns Martínez," What's on TV Tonight? An Efficient and Effective Personalized Recommender System of TV Programs" IEEE Transactions on Consumer Electronics, Vol. 55, No. 1, FEBRUARY 2009

[13]. Hyung W. Kim, Keejun Han" MovieMine: Personalized Movie Content Search by Utilizing User Comments" IEEE Transactions on Consumer Electronics, Vol. 58, No. 4, November 2012.

[14]. Magdalini Eirinaki, Malamati D. Louta, "A Trust-Aware System for Personalized User Recommendations in Social Networks" IEEE Transactions on Systems, Man, And Cybernetics: Systems, Vol. 44, No. 4, April 2014

[15]. Xiangyu Tang and Jie Zhou ," Dynamic Personalized Recommendation on Sparse Data" IEEE Transactions on Knowledge And Data Engineering, Vol. 25, No. 12, December 2013.

[16]. D. Lemire, S. Downes, and S. Paquet, "Diversity in Open Social Networks," technical report, University of Quebec, Montreal, 2008.