AN INTELLIGENT RECOMMENDATION SYSTEM TO ENHANCE THE TRAVEL SERVICES

Mr. Hrishikesh Teke[1], Mr. Parag Borle[2], Mr. Mayuresh Tiwari[3], Mr. Samadhan Kangale[4],Mr. Avinash Dandgule[5]

[1] *BE, Department of Computer Engineering, Sanjivani College of Engineering, Kopargaon, Maharashtra, India,*

[2] *BE, Department of Computer Engineering, Sanjivani College of Engineering, Kopargaon, Maharashtra, India,*

[3] *BE, Department of Computer Engineering, Sanjivani College of Engineering, Kopargaon, Maharashtra, India,*

[4] *BE, Department of Computer Engineering, Sanjivani College of Engineering, Kopargaon, Maharashtra, India,*

[5]*BE, Department of Computer Engineering, Sanjivani College of Engineering, Kopargaon, Maharashtra, India,*

ABSTRACT

Abstract: The tourism industry has specific features that explain its importance for economic growth and its affection toward IT systems. The travel package recommendation system plays a vital role in the tourism industries that analyze the characteristics of travel packages and develop the TAST model. TAST model can effectively collect the personalized characteristics of the travel information. TAST model can depict travel packages and tourists by different topic allocations, where the topic extraction is conditioned on both the tourists and the essential attributes (i.e., locations, travel seasons) of the landscapes. After generating TAST model, we pose cocktail method to create the lists for travel package recommendation. As compare to traditional approach the cocktail approach is more efficient for recommending the travel packages. Also, based on tourist relationships, the automatic travel groups are formed by using TRAST model.

Keyword: - *recommendation systems, collaborative filtering, cocktail approach, collaborative pricing, ranking travel package.*

1. INTRODUCTION

As an emerging trend, more and more travel companies provide on-line services. It is challenging for tourists to select interesting travel packages for satisfying their personalized needs. Moreover, to increase the profit, the travel companies have to understand the preferences from different tourists and serve more attractive packages. Therefore, it is essential for intelligent travel service is expected to increase dramatically.

A travel package is a service package delivered by a travel company for the personal or a group of tourists based on their travel preferences. A package usually includes the location and some related information, such as the cost, the travel period, and the transportation means. Specifically, the travel topics are the themes designed for this package, and the landscapes are the travel places of interest and attractions, which usually locate in nearby areas.

2. RELATED WORK

Collaborative filtering is a technique which filters the information using different technique of collaboration for different data sets. The big data sets of applications are included for collaboration filtering. Neighborhood models are the foundation of the Collaborative filtering. The Collaborative filtering is based on rating of items for different sets [4].

Recommender systems propose items from different alternatives for user by analyzing travel history or behavior. The user's behavior has affect from unseen interests of user. To invest on getting information about the interest of tourist is not favorable to make good recommendations. The present recommender systems based on collaborative-filtering focuses on user's interaction with the system. The information about inactive user is discarded. The topic model cooperated so that to find out the personalized ranking. The goal to create the item based collaborative filtering model. It deals with different problems that represent in old collaborative filtering scheme like over specialization and cold start problem [5].

Recommendation system is a vast exploration topic. The ample amount of research is done on recommendation system in industry to enhance the travel services. Interest in recommended systems is high as it represents research in problem rich. It has huge amount of applications that help the user to get a personal recommendation as well services. The example of this application is recommending books, CD and etc. The recommendation system still require advancements at running situation as to make it better in various fields such as financial services to investors, real-time applications and shopping cart [6].

Tour recommendation is different from other recommendation as the tourist interest in package is directly affected by its cost. Cost aware recommendation of package is need of the recommender system. The travel logs are collected from different agents of company then analyzed for time and financial cost connected to every travel package. The tourist has different level of affordability for aspect of cost. The recommendation system focuses on such factors to make it more effective [7].

3. SYSTEM MODEL

Proposed system architecture is shown in Figure 1 from which we can completely define a proposed system. Architecture description is given below.
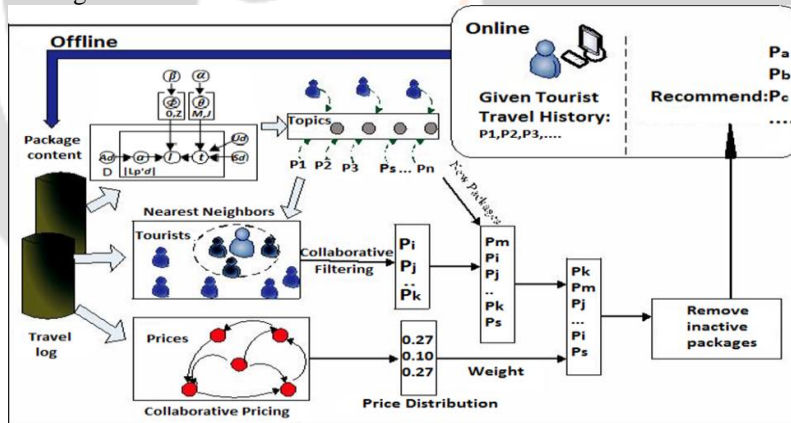

Fig -1: An architecture of Travel Package Recommendation System.

3.1 New Package Problem

In recommender systems, it is difficult to recommend new packages. The travel packages often have a life cycle and new packages are usually created. There are many landscapes will used in future, i.e. almost all the new travel packages are fully or partially composed by the existing landscapes. Let us take the year of 2012 as an example. There were 71 new packages in the data and only 3 of them are composed completely by new landscapes. Thus, topic distributions can be estimated by the topics of their landscapes for many new packages.

3.2 Collaborative Filtering for tourists

The method for generating the personalized candidate package set for each tourist by the collaborating filtering method. After we have obtained the topic distribution of each tourist and package by the TAST model, we can compute the similarity between each tourist by their topic distribution similarities. On the basis of collaborative filtering, for a given tourist, we delegate the items that are preferred by the tourists who have similar tastes. The package recommendation is more complex than the traditional ones. For example, it is not appropriate to recommend tourists in winter season for "Maple Leaf Adventure." In other words, for a given tourist, we should recommend the packages that are enjoyed by other tourists at the specific season. Indeed, we have obtained the seasonal topic distribution for each tourist from the TAST model. Multiple methods can be used to compute these similarities, such as matrix factorization, and graphical distances.

3.3 Collaborative Pricing

The price of travel packages varies package to package. In Collaborative Pricing the packages are classified into distinct sets then according to the range of tourists different possible prices are predicted. The packages having prices same or nearly same are recommended.

This section describes the technique to consider the price limit for generating a more unique travel package recommender system.

We divide the prices of the packages based on the variance of prices in the travel records, and the technique is similar to the one used in. The first step is to sort the prices of the travel records, and after that divide the sorted list PL into various sub lists in a binary-recursive way. Then, transition probabilities are calculated between price segments. Specifically, at first, if a tourist used a package with price state a before traveling a package with price state b, then the weight of the edge from a to b will plus 1. After adding the weights of all the tourists, we calculate them into transition probabilities, and all the transition probabilities constitute a state transition matrix. Depending on the current price state of a given tourist, we forecast the next possible price state. Finally, the predicted probability distribution obtained from tourists on each and furthermore these probabilities are used as weights to multiply the probabilities of the candidate packages in the rough recommendation list so as to reorder these packages. After removing the packages which are no longer active, we have the final recommendation list.
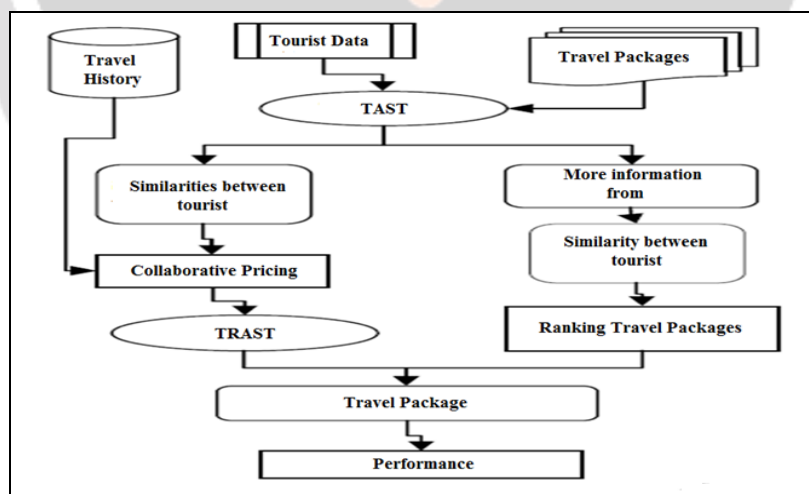
4. BLOCK DIAGRAM

Fig -2: Block diagram of Travel Package Recommendation System. [2]

4.1 TAST Model

The Tourist-Area-Season Topic (TAST) Model, which can define packages and tourists by different topic distributions. In the TAST model, the topics extracted depend on both the tourists and the essential attributes such as

place, seasons of the landscapes. The TAST model can well define the content of the travel packages and the interest of tourists.

4.1 TRAST Model

The TRAST model (Tourist-Relation-Area-Season-Topic) can be used for creating automatic travel group formation. Number of group formed together for different packages. If two people belong to distinct travel groups, elected the same travel package so they have same area of interest. Tourists present in same travel package may share similar Things like holiday pattern. A new attribute relationship is included so as to get the connections between tourists. The dormant relationships among the tourists are collected in the TRAST model.

4.1 Cocktail Model

Cocktail model is a hybrid recommendation strategy mainly based on Tourist Area Season Topic Model. It has ability to merge all possible constraints present in real world scenarios. The output of TAST model is considered to find seasonal nearest neighbors for each tourist and the candidate packages are ranked using collaborative filtering. Then new packages are included into the candidate list by calculating similarity with already generated candidate packages. Finally, the possible price distribution of each tourist is predicted by using collaborative pricing and reorders the packages. After removing the packages which are no longer active, we will have the final recommendation list.

5. CONCLUSION

The TAST model is utilized to build cocktail approach for personalized recommendation for travel package. While recommending the travel package different intrinsic features of topics and related information is analyzed. Also it determines the tourist interest for recommending package. This cocktail approach follows a hybrid recommendation strategy and has the ability to combine several constraints existing in the real-world scenario. Then, the TRAST model is derived from the TAST model. The dormant relationships among the tourists are collected in the TRAST model. TRAST model is used for effective analysis of automatic group formation.

ACKNOWLEDGEMENT

REFERENCES

[1] Qi Liu, Enhong Chen, Hui Xiong,Yong Ge, Zhongmou Li, and Xiang Wu, "A Cocktail Approach for Travel Package Recommendation", IEEE transactions on knowledge and data engineering, vol.26, no. 2, February 2014.
[2] Ms. R. Priyanka, Mr. T. Yoganandh, "A Novel Approach for Travel Package Recommendation Using Cock Tail Algorithm", IJETS, ISSN (P): 2349-3968, ISSN (O): 2349-3976, Volume 1 Issue 7, November 2014.
[3] Qi Liu, Yong Ge, Zhongmou Li, Enhong Chen, Hui Xiong, "Personalized Travel Package Recommendation", School of Computer Science and Technology, University of Science and Technology of China.
[4] Y. Koren and R. Bell, "Advances in Collaborative Filtering", Recommender Systems Handbook, chapter 5, pp. 145-186, 2011.
[5] B.D. Carolis, N. Novielli, V.L. Plantamura, and E. Gentile, "Generating Comparative Descriptions of Places of Interest in the Tourism Domain," Proc. Third ACM Conf. Recommender Systems (RecSys'09), pp. 277-280, 2009.
[6] 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.
[7] Y. Ge et al., "Cost-Aware Travel Tour Recommendation", Proc.17th ACM SIGKDD Int'l Conf. Knowledge Discovery and Data Mining (SIGKDD '11), pp.983-991, 2011.
[8] Mrs. A. Sharmila Banu, Mrs. M.Abirami, "A versatile approach for travel package recommendation using cocktail approach", IJAICT Volume 1, Issue 12, April 2015, ISSN 2348 - 9928.