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AVERSATILE APPROACH FOR TRAVEL PACKAGE RECOMMENDATION USING COCKTAIL ALGORITHM

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Abstract*— *As the worlds of business, entertainment, travel and Internet technology become more linked, new types of business data become available for creative use and formal analysis. This project provides a study of online travel information for personalized travel package suggestion to the best course of travel. A target along this line is to address the unique characteristics of travel data, which differentiates travel packages from traditional items for recommendation. The characteristics of the travel packages, tourist feedback, season are analyzed and used for proposing on personalized travel package recommendation.A tourist-area-season topic (TAST) model is developed to represent travel packages and tourists by different topic distributions, where the topic extraction is conditioned on both the tourists and the intrinsic features (i.e., locations, travel seasons) of the landscapes. This also provides the tourist information and tourist feedbacks to evaluate apackage for recommendation. The experimental results show that the approach is thus much more effective than traditional recommendation methods for travel package recommendation.

Keywords— Travel Package, Recommender Systems, Cocktail, Topic Modeling, Collaborative Filtering

I. INTRODUCTION

As an emerging trend, more and more travel companies provide online services. However, the rapid growth of online travel information imposes an increasing challenge for tourists who have to choose from a large number of available 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, the demand for intelligent travel services is expected to increase dramatically. Since recommender systems have been successfully applied to enhance the quality of service in a number of fields, it is natural choice to provide travel package recommendations. Actually, recommendations for tourists have been studied before and to the best of our knowledge, the first operative tourism recommender system was introduced by Delgado and Davidson. Despite of the increasing interests in this field, the problem of leveraging unique features to distinguish personalized travel package recommendations from traditional recon- mender systems remains pretty open.

A cocktail approach on personalized travel package recommendation to address these challenges. Specifically, first analyze the key characteristics of the existing travel packages. Along this line, travel time and travel destinations are divided into different seasons and areas. Then, develop a Tourist-Area-Season Topic (TAST) model, which can represent travel packages and tourists by different topic distributions. In the TAST model, the extraction of topics is conditioned on both the tourists and the intrinsic features (i.e., locations, travel seasons) of the landscapes. As a result, the TAST model can well represent the content of the travel packages and the interests of the tourists. Based on this TAST model, a cocktail approach is developed for personalized travel package recommendation by considering some additional factors including the seasonal behaviors of tourists, the prices of travel packages, and the cold start problem of new packages. Finally, the experimental results on real-world travel data show that the TAST model can effectively capture the unique characteristics of travel data and the cocktail recommendation approach performs much better than traditional techniques[1][2].

Various models of the system and the corresponding travel package recommendation strategies based on TAST model. Also, the tourist-relation-area-season topic (TRAST) model, which helps understand the reasons why tourists form a travel group. This goes beyond personalized package recommendations and is helpful for capturing the latent relationships among the tourists in each travel group. In addition, systematic experiments conducted on the real-world data. These experiments not only demonstrate that the TRAST model can be used as an assessment for travel group automatic formation but also provide more insights into the TAST model and the cocktail recommendation approach.

1.1 Objective

Travel package recommendation system is to present more powerful and flexible travel recommender systems. Time complexity rate of the system is to be reduced in this system. Reliability of the system is to be enhanced. Efficiency rate

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of the system is to be improved. High quality results in the recommender system.

1.2 Scope

Tourism is most favored activity when people have free time. Many tourism facilities are provided by many organizations. The people or the tourist chooses his own travel package according to his personal interest. The travel companies focus on the interest of tourist so that to increase their market value and provide huge packages. So there is needed to make travel package more effective. Recommender systems are a developing area and attraction towards it is growing day by day. Through recommender systems the number of product recommendation are achieved while dealing with customer. In e- commerce the recommender system are having great victory[3][4].

Personalized travel package has many challenges while designing and executing the recommended system. So in this project cocktail approach is introduced to overcome those challenges. It analyzes different characteristics of exiting package. Then develop the Tourist Area Season Topic (TAST) model which represents packages. Cocktail approach has some extra factors like season and pricing for recommending personal travel package.

II. EXISTING SYSTEM

There are many technical and domain challenges inherent in designing and implementing an effective recommender system for personalized travel package recommendation. Travel data are much fewer and sparser than traditional items such as movies for recommendation, because the costs for a travel are much more expensive than watching a movie [1][]][2][3].Traditional recommender systems usually rely on user explicit ratings. However, for travel data the user ratings are usually not conveniently available.

2.1 Disadvantages

Recommendation has a long period of stable value.The values of travel packages can easily depreciate over time and a package usually only lasts for a certain period of time[5][6].

There are some limitations with the performance evaluation,which is based on the ability to recover omitted (hide) test data and a simple user study.

2.3 Need for Proposed System

This system is aimed to make personalized travel package recommendations for the tourists. The tourists are the users, the items are the existing packages, and exploit the real-world travel data set provided by the travels for building recommender systems. A Tourist-Area-Season Topic (TAST) model can represent travel packages and tourists by different topic distributions. In the TAST model, the extraction of topics is conditioned on the tourists and the intrinsic features. Based on the TAST model, a mixed approach is developed for personalized travel package recommendation by considering some factors including the seasonal behaviours of tourists, the prices of travel packages.

2.3 Advantages

The proposed model represents the content of the travel packages and the interests of the tourists. It can effectively capture the unique characteristics of travel data. The mixed recommendation approach performs much better than additional techniques[7][8].

III. TAST MODEL

The TAST topic model can be accomplished with the help of Bayesian networks in which similarity between packages and tourists can be measured. A Bayesian network is probabilistic graphical model that represents a set of random variables and their conditional dependencies via a directed acyclic graph (DAG)[2].When recommending a package to a tourist topic is to be decided, it may be the travel places which is visited by tourist or interested in. These packages depend on seasons and also the number of tourists for the package. These travel packages are based on landscape. Landscapes are originated according to season and topic. Limitations on price depending on tourist also represent a factor of topic.

3.1 Cocktail Recommendation

Package recommendation for personal travel is based on TAST model which is a cocktail approach and it represents the hybrid recommendation. Hybrid recommendation combines different techniques to enhance performance of recommendation. The output of the topic from TAST is used to found out seasonal nearest neighbor for every tourist and ranks are allocated to customer package using collaborative filtering. Candidate list is generated in which new packages are added by means of similar packages that were already generated. Then Collaborate price with package by reordering it with feasible price. Remove the unrated package and finalize it for package recommendation.

3.2 Collaborative Pricing

Package recommender system has one more factor price. The price of travel packages differ package to package. In Collaborative Pricing the prices of package are divided into different sets then predict the different possible prices according the range of tourists. The packages having prices same or nearly same are recommended. Transition

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probability among different packages is computed for each price set. For example if a tourist used a package of price A before traveling a package B then edgefrom A to B will weight +1. The normalized transition probability is generated after summing the all weights of tourists. Inactive packages are removed and final list for recommendation is generated.

3.3 New Package

The problem occurs when a new package is to be recommended to the tourist. Recommended packages are based on the interested in similar package. So here tourist's rates different package as from 1 to 10 and a new recommendation is generated according to rating and its personal or similar package. The new package contains the similar package recommendation as well the probable interest rating from list[9][10].

3.4 Trast Model

The tourist-relation-area-season topic (TRAST)model has been proposed, which help sunderst and the reasons why tourists form a travel group. This goes beyond personalized package recommendations and is helpful for capturing thel aten trelationships among the touristsin eachtravelgroup. Inaddition,systematic experiments are conductedon thereal world data. These experiments not only demonstrate that theTRASTmodelcanbe usedas an assessmentfor travel group automatic formation but also provide moreinsightsinto theTAST modelandthe cocktail recommendation approach. The TAST model doesn't focus on travel group information. Number of group formed together for different packages. If two tourists have taken same package but are in different group so it is considered as they have similar interest. Tourists present in same travel package may share similar Things like holiday pattern. A new parameter *relationship* is added so that gets the connections between tourists. This topic is known as TRAST. It focuses on the relation the tourist maintains with other tourist.

3.5 Usecase Diagram

The use case diagram shows the connection between actor i.e. traveler & activity of the system and Actor. This use case diagram shows the connection between User and activity of the system and Administrator. In this use case diagram the Travel Management System has eight use cases. In this use cases are created for user account creation, login, ticketing, cocktail, topic modeling, and collaborative filtering.

3.6 Sequence Diagram

Sequence diagram shows the relationship between classes arranged in a time sequence. The sequence diagram is designed for travel package recommendation. The given sequence diagram has three objects such as user, administrator and databases. Here user sends the request to the administrator for the account creation and selects the travel package recommended by the administrator and books the ticket for the travel package.

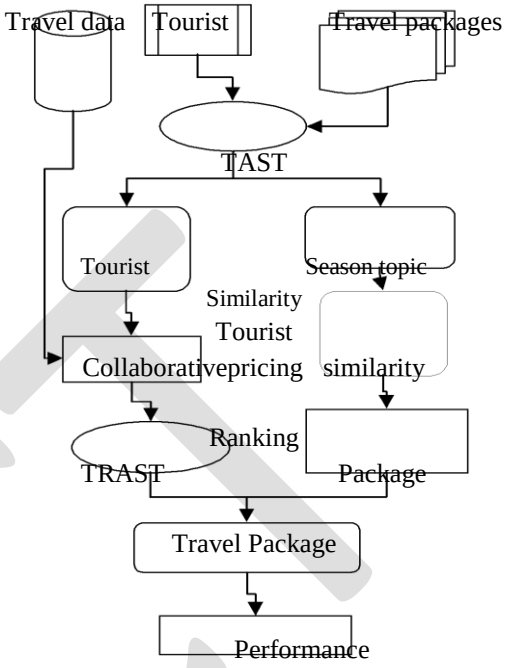

Fig 1: System Architecture

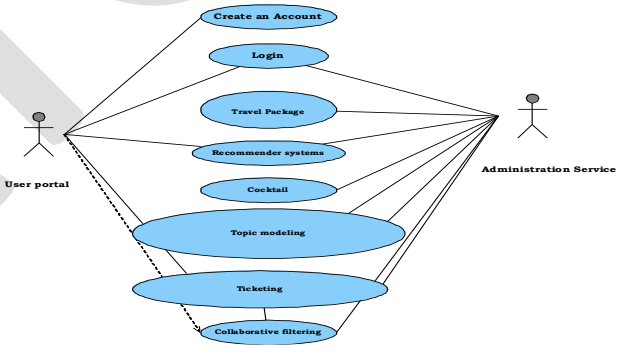

Fig 2: use case diagram

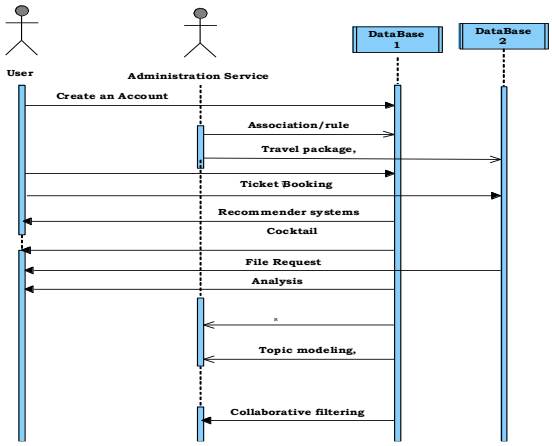

Fig 3: Sequence Diagram

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IV. IMPLEMENTATION

4.1 User Module

In this module, Users are having authentication and security to access the detail which is presented in the ontology system. Before accessing or searching the details user should have the account in that otherwise they should register first. He allows the users to view the tourist area and to download the details. Once the user chooses a tourist area he or she is provided with a recommended list of travel companies. Then he provided with payment page and after that he can choose the package details and finally he chooses the type of package.

4.2 Administrator Module

The administrator can approve the travel company registration and can monitor the company status. He also can view the user list, reserved packages and the company prices. He can remove the company once he found the company is not providing the service properly. He also tracks the packages and finds the inactive packages. He can view the performance of the package booking history[11].

4.3 Associate Module

In this module, Associate can register his own company using the registration form. Once he registered his information is transferred to the administrator for the approval. After the approval, associate can receive the booking from the company. He can update his account credentials such as password and personal details .Associate has to depend on the administrator actions.

4.4 Taste Module

This module is used to implement the Tourist Area Season Topic details. This provides the user about the tourist area details such as season, location, temperature, famous spots, etc. It also provides the user with the videos, travel guide and travel map.In the TAST model, the extraction of topics is conditioned on both the tourists and the intrinsic features (i.e., locations, travel seasons) of the landscapes. Landscape has some intrinsic features like the geographic location and the right travel seasons.The mined relationships will be used as features to help automatically form travel groups.

4.5 Booking Module

The user is provided with the travel booking and recommended package booking. Travel booking provides different modes of travel and classes of particular travel and then he can book successfully after payment process. Package booking comprises of domestic and international.User is recommended with the different packages such as single, pear, team and bulk packages. Then user can pick the package he wants and finally he booked the recommended travel package.

V. CONCLUSION

The TAST model is utilized to build cocktail approach for personalized recommendation for travel package. The cocktail approach is based on hybrid recommendation strategy. TAST model is extended to TRAST model which acquire the relations between tourists in each group. TRAST model is used for effective analysis of automatic formation.

VI. FUTURE ENHANCEMENTS

Cocktail approach disregards the specific preferences of the tourist while he/she is planning a trip, and quality of the recommendation result is decreased in this system. Thus the reliability of this recommender system is lower. In order to overcome these problems, the combination of case based recommendation can be proposed. Case-based recommendation is a form of content-based recommendation that emphasizes the use of structured representations and similarity-based retrieval during recommendation. In summary then, case-based recommendation provides for a powerful and effective form of recommendation that is well suited to many product recommendation scenarios. As a style of recommendation, its use of case knowledge and product similarity makes particular sense in the context of interactive recommendation scenarios where recommender system and user must collaborative in a flexible and transparent manner. Moreover, the case-based approach enjoys a level of transparency and flexibility that is not always possible with other forms of recommendation.

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