

Package Tour Recommendation System using Decision Tree Algorithm

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Abstract: The global market size of online travel agencies was 470 billion US dollars. Basically, travel agencies are companies that are selling travel related services like tourist activities, accommodation, transportation services etc. to the public. Package tour is also a service provided by travel agencies to their customers. Package tour for a particular destination is best option for an individual or a group of people who wants to hassle free trip. But list of travel agencies is increasing day by day and choosing a best travel agency for a particular trip is really a difficult job. Machine Learning algorithm can solve this problem with the help of Recommendation System. In this paper I am going to design a Package Tour Recommendation System using Decision Tree Algorithm that receive tourist request for package tour, analyse it and recommend top three travel agencies. Decision Tree algorithm is one of the most popular and effective machine learning algorithms for recommendation system. In today's world Recommendation system enters in almost every field like entertainment, social media, e-commerce, advertisement industry etc.

Keywords: Package Tour, Travel Agencies, Machine Learning, Recommendation System, Decision Tree Algorithm.

1. Introduction

Tourism come to existence when people start thinking for some private time for his/her own or with family. Initially it was a hectic job to plan a tour but now tourism has substantially benefited with ICT and especially from Internet Technology. Now people can search place to visit, time to visit, travel ticket on their mobile or PC. In world economy Tourism Industry play an important role [11]. South East Asia is the fastest growing regions for tour and travel.

Planning a comfortable and budget friendly tour is a very complex decision because it include many factors like choosing place to visit, selecting best hotels, choosing best rout, mode of transport, restaurant etc. if anyone will not meet our expectation, then the entire tour will be disturbed. To overcome these issues people, go for package tour in which entire responsibilities are taken by tour and travel company. Now a days internet is the prime source for tourists for all information about trip. But huge volume of heterogeneous information creates confusions among tourist as well as misguide them. To overcome these difficulties Artificial Intelligence (AI), introduce Recommendation System to help the tourists for selecting best options among various available options in the field of tourism.

Recommendation System is the product of Artificial Intelligence and Machine Learning. It come to existence in the mid of 1990. Recommendation systems where successfully implemented in many domains like social media, entertainment, ecommerce etc. Recommendation system is an information filtering system that is used machine learning algorithms to recommend the users an option based on his / her likings, quality, performance and also past history etc. Fig 1 shows the basic concept of recommendation system in which user submit their requirement to system for

recommendation, the system uses Machine Learning tools and techniques to recommend an option which are good for the user and user also give feedback about system's recommendation that is noted by system as an element of future recommendation.

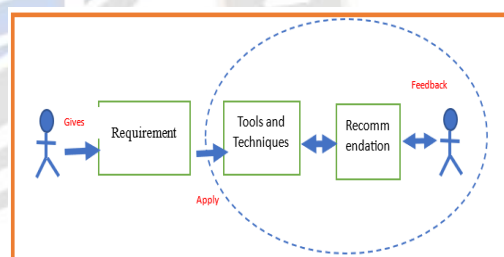


Fig 1. Recommendation System

A package tour is a service provided by tour and travel companies for an individual customer or a group depending upon their requirements. A package tour generally includes all tour related activities like food and lodging, transportation etc. People are opted package tour for enjoining hassle-free vacations. In today's world we have so many tour and travel companies that are ready to serve us with their lucrative offers and discounts but choosing the best one that suit us is a difficult task because "options create confusions". To overcome this problem, we are going to design a package tour recommendation system using decision tree algorithm that help tourist to take better decision.

2. Machine Learning Algorithm

The term machine learning was coined in 1959 by Arthur Samuel. Machine Learning is a branch of Artificial Intelligent that focuses on the use of data and algorithms to imitate the way that human learn and gradually improving the accuracy.

The machine Learning algorithm are classified into three categories which are supervised, unsupervised and reinforcement learning. Supervised learning refers to the Machine learning in which the machine needs external supervision to learn. But in unsupervised learning the machine does not need any external supervision to learn from the data. In case of reinforcement learning an agent interact with its environment by producing some actions and learn with the help of feedback.

The goal of this paper is to implement a recommendation system that recommend the package tour for tourist depending on options given by many companies. For implementing above system, we have so many machine learning algorithms among them we have chosen Decision Tree algorithm for our system.

Decision Tree is a supervised learning technique that can be used for both classification and regression problems. This machine learning algorithm is a tree like structure where each node represents a binary condition and depending on true and false value tree is subdivided into branches each branch corresponds to attributes and each leaf node represent prediction. The major challenge for Decision Tree algorithm is to identification of root node at each level. The popular measures for attribute selection are Information Gain and Gini Index.

3. Methodology

With the increase of tourism number of tour and travel companies are also increasing significantly. The main purpose of my system is to recommend best Package tour operator for tourist according to their requirement. The working process of my system will be summarized in following steps:

Step1: To serve the customer in a better way my system looking for most trusted and reliable companies in the market because best tour operator can serve the tourist more. The

system is constantly communicated with good travel vendors to join our Package Tour Recommendation System (PTRS).

Step 2: Tour operator vendors are Registered into the system using registration form.

Step 3: The system checks their authenticity and approved them as certified vendors or reject them. The authentication process includes checking of company licence, year of establishment, achievements, government certification, users review etc.

Step 4: A tourist first register into the system and after that he or she can login, the system authenticates them with one-time password (OTP) to their email id and mobile.

Step 5: After proper authentication of customer, the system provides a travel registration form to customer for mentioning their requirement about tours like place to visit, time to visit, expected budget, number of tourists, number of days, mode of transportation, categories of hotels etc.

Step 6: The system receives customer requirement and send to all the tour operator vendors for their response.

Step 7: Tour operator vendors receives customer query analyse them carefully and send their offers to the system.

Step 8: Now the system applies Decision Tree algorithm on the dataset given by vendors.

Step 9: The decision tree algorithm selects best three options and send to the tourist for selection.

Step 10: Now tourist select one option among recommended options and enjoy their trip.

Step 11: After completion of tour our system send a feedback form to customer and the customer response about operator decide the gradation of vender in the system.

Fig 2 shows the working process of the system in pictorial form.

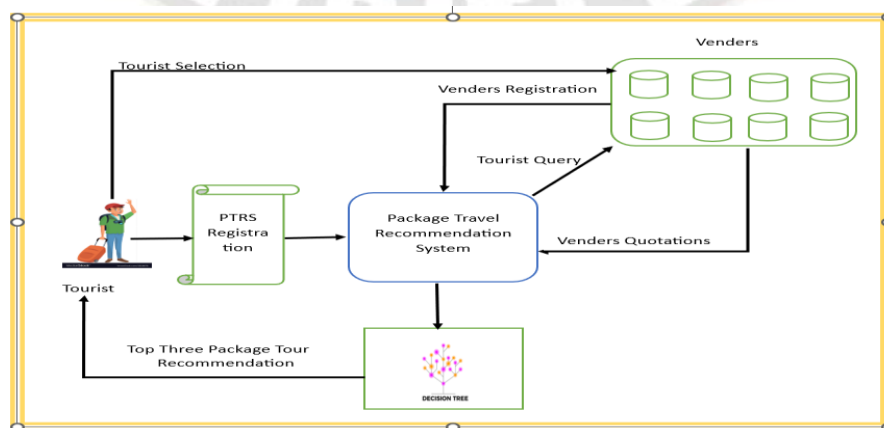


Fig 2. Package Travel Recommendation System

4. Conclusion

It is very difficult for a human being to choose best option among several different options but machine learning algorithm can do it efficiently and accurately that's why recommendation system is entered in almost every fields. Package Tour Recommendation System is an example of use of machine learning in the field of tour and travels for cozy and comfortable trip. In this paper I have tried to implement a system that recommend best package tour option among many options for a customer using decision tree algorithm. Though I am at early stage of development and many think I wish to add with this package tour recommendation system. In near future I will add tourist safety module. This safety module will activate when a tourist chooses a particular recommendation from the system. Whenever a tourist facing issues during his/her trip then they contact to safety module and the module acts accordingly for safety and security of customer/s.

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