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Conceptual Tourism Recommendation System using Service Blue printing and Customer Journey Map

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ABSTRACT

Tourism sector is one of the integral parts of any country and it has also become an area of increasing revenue and also as a new venture to invest in for gaining profits and with the advancement in technology and number of ways to use the technology to bring more convenience to the user, a lot of Online Travel Agencies (OTA) have begun to rise and these agencies provide a lot of information for the user in order to plan their trip for their desired place. Many OTA's provide user with lot of information using some recommendation systems and sometimes this huge information makes decision making more complex for the user. In this project, Conceptual Framework for Tourism Recommendation is proposed to facilitate the user with planning their trip without much hassle and in a convenient manner. Data Mining is used to give useful insights to the agency providing the trip. Google Binge API is used to calculate the shortest distance between two locations, it uses KNN to provide accurate results.

1.INTRODUCTION

Tourism, these days involves mass availability and mass participation of peoples in holidays for enjoyment purpose. But many times, a tourist cannot decide which place to visit, or where to stay, also the cost associated, point of interest of each user and many such factors. So, we are going to propose a website which will recommend places of attractions to the users. For Dataset, we have scrapped holidify.com and collected data of various places and build a data-set around 1 Lakh attributes. Places were recommended based on two factors, similar users and similar contents. Collaborative Filtering was used to recommend places based on similar users and Content Based Filtering was used to recommend places based on similar content. The Machine learning model was trained and pickled so that can be used in Front-end, also data was stored in Mysql Database.

In recent years, smart phone has been an inalienable part of people's life. People can obtain all the information they need at their fingertips every day. Tourism has become an important sector that has an impact[3] on the development of the country's economy as on this date. Tourism has become one of the biggest industry for gaining wealth in the world many countries like UAE, Japan, USA gain lot of wealth from the tourism industry And the most crucial task, to carry[2] this out efficiently is to plan the

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trip. Conventionally this planning was done by travel agents . For example, a particular travel company would plan the tours of a particular place, showing the prime tourist attractions. For example a person want to travel from Mumbai to Delhi to the agent will list down all the important tourist places and accordingly plan his trip like first he should visit Akshardham temple then red fort but does every one like to visit temple. this trip won't satisfy everyone. If a user is interested in places like museums and aquariums, then they would have to plan such a trip on their own.

Nowadays, mobile phones are a necessary part of people's life. There is a high amount of rise in the number of mobile computing applications which are centered on people's day-to-day life. One of the areas in which the user can benefit from smartphone applications is tourism traveling.So the main aim of the project is to make an mobile application where the tourist [8] will be recommended some places according his or her interests and based on that he or she can his or her own trip. Choosing a tourist destination from the information which is top rated by other user, is one of the most difficult tasks for tourists who are making travel plans, both before and during their travel.There are lot of websites and applications that provide the top rated places from various cities which may not be the place user likes.Also,some websites based on nearest location, try to recommend places to the nearest location of the user. So, to overcome this, similar contents and similar set of users need to be analyzed and accordingly build an optimized recommendation system.

2. BASIC TERMINOLOGIES USED A. Collaborative Filtering Algorithm

Collaborative Filtering is used in recommendation systems. There are two types of collaborative filtering systems, Item- based and Content-based Collaborative Filtering.[6] In general, Collaborative Filtering is the process of filtering information or patterns using techniques involving collaboration among multiple agents, viewpoints, data sources, etc. There are various reasons why Collaborative Filtering is used like it can be used with large datasets. As compared to content-based filtering, the accuracy of Collaborative Filtering is much more. Using Collaborative Filtering, the whole process of recommending tourists places can be divided into three steps:

a. The representation of tourist information, wherein the travel style and reviews of the user are checked.

b. Next, the similarity of tourists can be computed according to the visiting history[7] data and the Collaborative Filtering algorithm presented by us.c. The generation of attraction recommendations. On the basis of similarities with other similar users, the top Attractions, Restaurants, and Hotels are recommended.

B. Content Based Filtering Algorithm
Content-based filtering methods focus on both the profile of the user's preferences and the item description for recommending items that are similar to the items that are rated very high by others in the past.[1] Disadvantages are

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Since the feature representation of the items are hand- engineered to some extent,[4] this technique requires a lot of domain knowledge. Therefore, the model can only be as good as the hand-engineered features. The model can only make recommendations based on existing interests of the user. In other words, the model has certain limitations to work on the users' existing interests.

C. Web Scrapping

Web scraping is a technique of extracting useful data from large websites. Web scraping helps to build a dataset which can be used by algorithms for further computations. Web scrapping is illegal to a certain extent. In holidify.com various attributes such as placIn Python, web scrapping is performed through Beautiful Soup Library using requests method.

3.RELATED WORK

In the literature, there are several studies about users' habits and routines in a city using digital traces. Some of them analyzed GPS [11]data and cellular footprints of users to understand, for instance, their usual trajectories. A Recommendation System is a personalization tool that offers users with a list of items that best fit their individual taste. A Recommendation System analyses the available data and recommends the items according to user's interest. The more the system understands the [9]interest of the users, the better recommendations, it can perform. Recommendation System was proposed to cope with the problem of information overload. There are so many traditional methods available for recommending the items to the users. For example, we have content-based filtering, Collaborative based Filtering, and knowledge-based filtering but some of these methods have some shortcomings.. They used the MovieLens datasets to compare the different techniques of clustering. In , the authors investigated the applicability of the cluster ensemble approaches for recommender systems. They utilized kmeans and Self-Organizing Maps (SOM) [10]as baseline clustering techniques, and the multiple clustering ensemble technique to combine the results of clusters

	Google Goggles	GuideMe	Our Proposed System
Input	Image	Image/ Text	Image, Text
Output	i) Recognize image ii) Give Name iii) Web Search Results	i) Recognize image ii) Give Name iii) Give Details	i) Recognize image ii) Suggest nearby places in the given city based on users' interests.
Image Category	Any Image	Images of Monuments or famous buildings	Images of 1. Hotels 2. Attractions 3. Restaurants

Table 1. Comparison of various similar systems for place recognition.

In the authors proposed a keyword-aware service recommendation method, named KASR, to indicate users' preferences and generate appropriate recommendations on

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MapReduce for big data applications. In , Lee et al. proposed an adaptive recommendation algorithm, ACFSC, that is focused on scalable clustering. They addressed the problem of scalability by composing neighborhood based on reducing time complexity. They also addressed the problem of sparsity by making items' and users' feature vectors incrementally learning. In , the authors proposed a typical model that integrates collaborative filtering, clustering techniques, and social network analysis (SNA) in order to enhance the perdition accuracy results in recommender systems.

Their model uses SNA to identify the people who are most influential on social networks and then uses these people to conduct clustering analysis. Following that, the model focuses on cluster-index collaborative filtering to make accurate recommendations. Additionally, Tian et al. developed a new method for improving recommendation quality by formalizing trust relationships in online social networks. In [12], authors proposed two varieties of algorithms for developing an effective recommender system.

4. METHODOLOGY

Place Recommendation System The system has a MySQL database, a Web Server, and a front-end application. There is a GUI for the user which takes basic information from the users and saves the answers given by user in the database and then it analyze the answers given by the users and upon that analysis it recommends new places to the users using various algorithms.

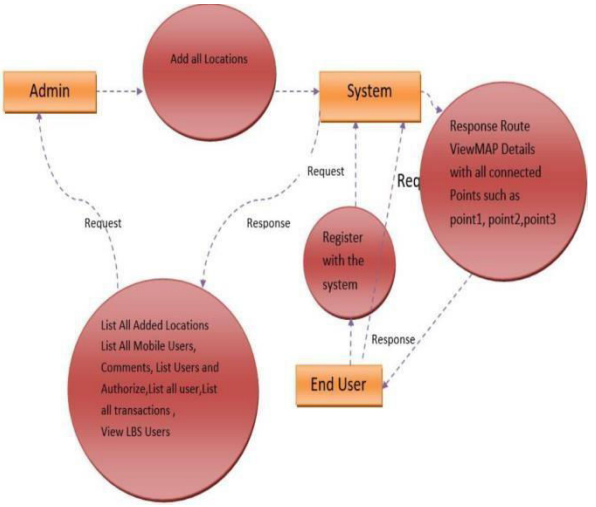

Fig.1. Recommendation system architecture.

a) Data Cleaning and Data Pre-Processing: Data collected by scraping and downloading data from trip-advisor has lot of missing values and lot wrong data. hence it was important to a cleaning and removing redundant or missing data from the datasets. Moreover, it was also necessary converting all the data into categorical data.

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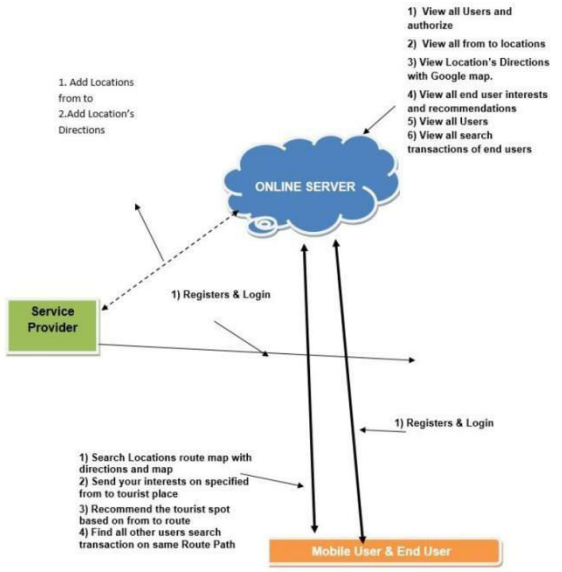

Fig.2 –Architecture Diagram

b) Recommendation by content based and Collaborative filtering: Initial collected data about the user are fed into these two algorithms and based on the input given new places are recommended to the users in order to increase the efficiency of the algorithm the size of the dataset is increased after checking the efficiency of the algorithm we have found out the efficiency as 78%.

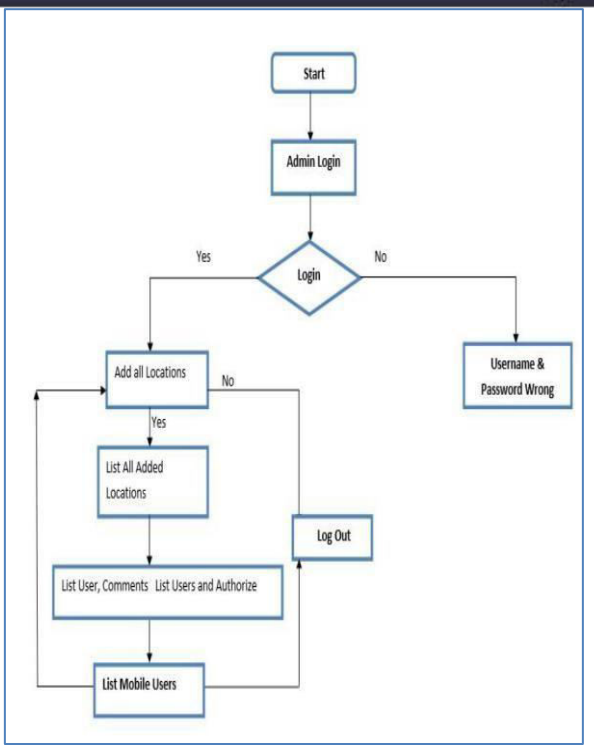

Fig 3–Flow Diagram for Admisistration

Without knowing anything about items and users themselves, we think two users are similar when they give the same item similar ratings. Analogously, for Item-based CF, we say two items are similar when they received similar ratings from a same user. Then, we will make prediction for a target user on an item by calculating weighted average of ratings on most X similar items from this user. One key advantage of Itembased CF is the stability which is that the ratings on a given item will not change significantly overtime, unlike the tastes of human beings.

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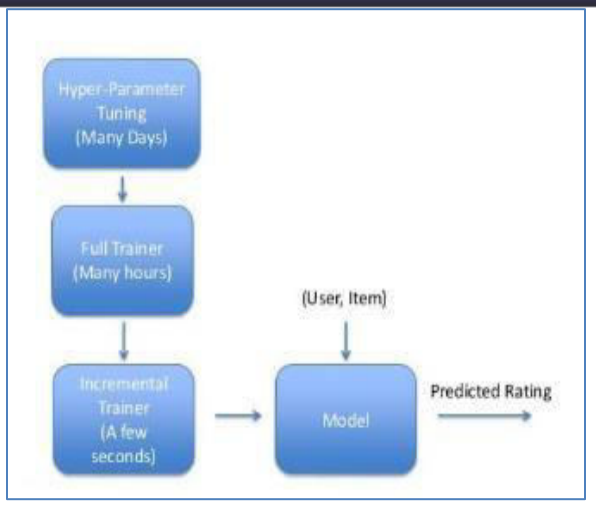

Fig4- Calculating weighted average of ratings

c)Query Processing on Road Networks

Indexing on road networks have been extensively studied in the literature. Various shortest path indices have been developed to support shortest path search efficiently. Papadias et al. study how to process range queries and KNN queries over points-ofinterest, with respect to shortest path distances on a road network. The evaluation of range queries and KNN queries can be further accelerated by specialized indices. In our problem scenario, query users require accurate results that are computed with respect to live traffic information. All the above works require the LBS to know the weights (travel times) of all road segments. Since the LBS lacks the infrastructure for monitoring road traffic, the above works are inapplicable to our problem. Some works attempt to model the travel times of road segments as time-varying functions, which can be extracted from historical traffic patterns. These functions may capture the effects of periodic events (e.g., rush hours, weekdays). Nevertheless, they still cannot reflect live traffic information, which can be affected by sudden events, e.g., congestions, accidents and road maintenance. Landmark and distance oracle can be applied to estimate shortest path distance bounds between two nodes in a road network, which can be used to prune irrelevant objects and early detect results. The above works are inapplicable to our problem because they consider constant travel times on road segments (as opposed to live traffic). Furthermore, in this paper, we propose novel lower/upper travel time bounds derived from both the road network and the information of previously obtained routes; these bounds have not been studied before.

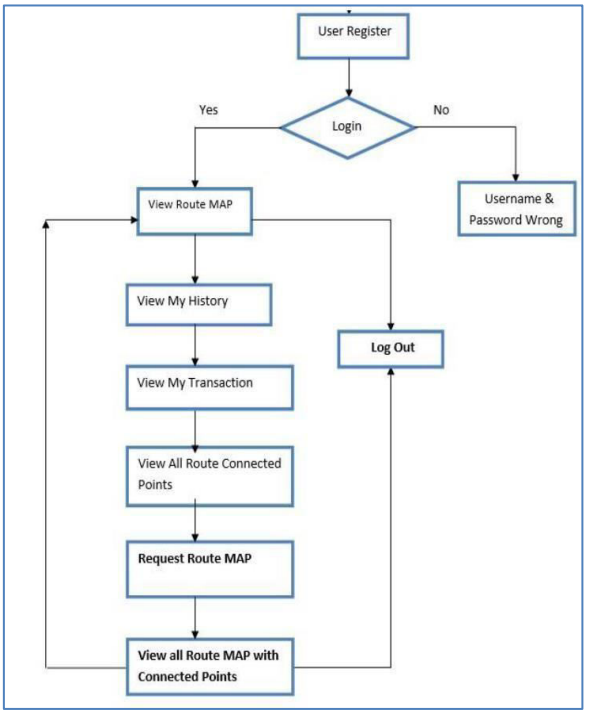

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Fig 5–Flow Diagram for User Process

d) **Querying on Online Route APIs**

Online route APIs. An online route API has access to current traffic information. It takes a route request as input and then returns a route along with travel times. A restaurant rating website: data and queries. The example below illustrates the request and response format of Google Directions API.
Bing Maps API uses a similar format.

e) Customer Journey Mapping

Customer journey Mapping is a design thinking methodology. A *customer journey* map is a visual representation of a

customer's experience with a company's service or product usage. It focuses on the following

1.Which touchpoints are particularly effective from the customer's point of view – which are not?
2. To what extent does each touchpoint contribute to positively influencing the customer'sexperience?
3.Are the possible touchpoints along the customer journey coordinated with each other?
4.How do your employees evaluate the individual touchpoints in terms of effort vs. benefits? Are there touchpoints that offer little customer benefit but are very complex? Are there too many touchpoints that tend to confuse the customer? 5.Which touchpoints does the
6.Are the touchpoints along the customer journey enough? Where are there gaps? Whichadditional contact points can be created for the customer?
7.What can be automated and how?
8.competitor not have? Why?

Touchpoints can be controlled by the company, e.g. advertisements, TV or radio spots, brochures/catalogues, flyers, trade fairs and events, customer hotline/call centres, mailings, personal consultation/sales, point of sale, shop fittings.

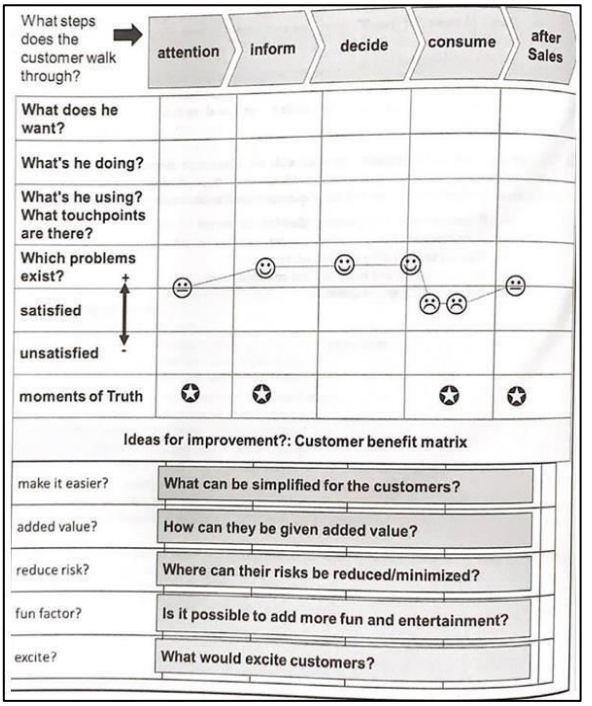

Fig 6 –Customer Journey Map with Customer benefit matrix

d) Service Blueprint

A service blueprint visualizes the relationships between different service components— people, props (physical or digital evidence), and processes — that are directly tied to touchpoints in a customer

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journey map. A service blueprint corresponds to a specific customer journey and the specific user goals associated to that journey.

Step-1 Define Target Customer
Step-2 Create Customer Journey
Step-3 Design External Appearance
Step-4 Design Touch Points
Step-5 Analysis of Internal Process
Step-6 Optimize process

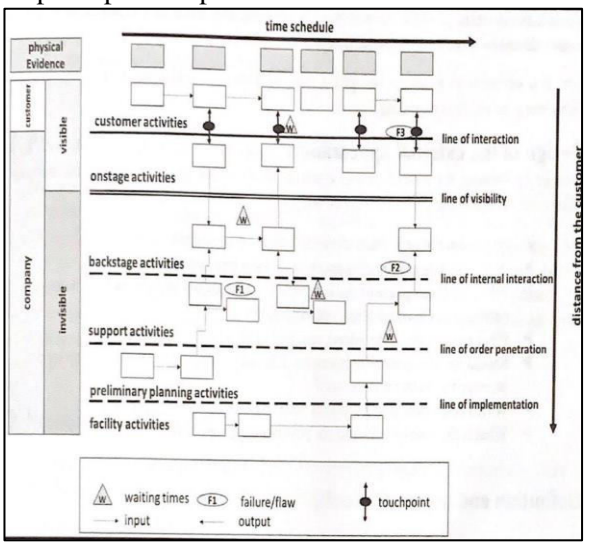

Fig 7 –Service Blueprint

5. CONCLUSION AND FUTURE ENHANCEMENT

As a result of the rapid growth in the numbers of tourists who are travelling, the Internet is becoming increasingly populated with travel information. When selecting their preferred destinations before or during their travel to an unfamiliar city, tourists can therefore easily be overwhelmed. Destination recommendation systems (DRSs) are recognised as a valuable decision-support tool for online travel as well as for tourism marketing.

A model-based DRS and an ensemble-based DRS with an adaptive, responsive and interactive user interface has been successfully developed and implemented. The DRS aims to assist tourists plan before or during their visit to an unfamiliar city. Both technical and practical aspects were considered, including data sparsity, scalability, transparency, system accuracy, usability and user acceptance.

As for future work, we plan to add more enhancements to security such as sending a confirmation mail once the user has been authorized and we also plan to add a vehicle service module to create more usability for the user. In vehicle module, vehicle providers can register through their respective information and users have a choice o choose from the selected list of vehicle providers

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