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Implementation of Advanced Road Trip Planner for Tourism 4.0

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***Abstract*----The main goal of Advanced Smart Road Trip Planner is to help the User to plan an entire road trip via a Single Web Application. All the tasks related to road trip planning like Selecting the Destination, along with recommendations and Interactive Maps, Facility to share the trip, Vehicle Rentals, Recommendations for nearby places to visit, popular spots auto shown, Budget Management Facilities, Checklist Facilities, Itinerary Management, User-Friendly Interface, Quick assistance through ChatBot, Feedback Forms, and many more. This Web Application will give provision to the users to plan their customized trips with a more adventurous feel.**

***Keywords*—Smart Recommendations, ChatBot, Maps, Web App, Itinerary, Checklist, Smart Tourism**

I. INTRODUCTION

Now-a-days almost all the trip organizers plan their trips according to their itinerary but none are flexible enough to let users plan their own trip according to their own choices. Hence we come up with an idea to let the customer decide where to go, how to go and enjoy according to their definition of "Explore". Also, many users are not traveling with fixed plans and they need adventure and that randomness in their travels which comes after unplanned trips. Hence the idea behind this project is to give a rough plan but that should be random and flexible enough and also budget-friendly to satisfy the user.

Problem Definition

To implement a Web Application Advanced Road Trip Planner which will be helpful and handy technology for adventure loving explorers such that this application will be mainly a recommendation system and virtual assistance where users will find the destination, places to visit, stay recommendations and many more necessary aspects of travel planning according to their budget, interests and travel history.

Deep learning models play more and more important roles in content recommending systems. A look-alike algorithm may be a good selection to increase the audience for top quality long-tail contents. "But the traditional look-alike models which are widely utilized in online advertising aren't suitable for recommending systems thanks to the strict requirement of both real-time and effectiveness" [1]. Thus the paper [1] tackles the challenge of conflict between real-time and effectiveness.

A sensible tour route planning algorithm which is predicated on Naive Bayes interest data processing machine learning is employed in [2] , to unravel the issues of current tour route planning methods. A mass of training data on tourists' interests and needs is learnt and a machine learning model of Naive Bayes interest data mining is set up . The feature of the optimal tourist site mining algorithm is to look for the simplest geographically distributed tourist sites within the neighborhoods buffer, which satisfies the requirements of tourists and costs the least expenditure. When combined with the factors of GIS service, track information, and tourist site information that influence motive benefits during the whole trip, the optimal tour route planning algorithm that is based on closed-loop structure is set up.

According to a survey 85 percent of people finalize their activities at their final destination. But hardly any website lets users plan trips before reaching. Hence Artificial Intelligence will make it happen using user history and preferences to have dynamic trip planning on any stage of the trip. Also the concept is to use natural language to define the trip and AI will detect the exact meaning for that sentence and suggest appropriate trip plan

From this we came to the conclusion that travellers love to explore and AI is the key solution to be used to make it happen to plan a good trip with a great plan which is most suitable for particular users. We built a system containing offline training and online serving. With techniques such as asynchronous pre-processing and seeds clustering, online predicting is able to be real-time. Thus we proposed an advanced road trip planner platform to help every tourist create their itinerary based on their preferences and

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plan a trip according to their needs.

The rest of the article is organized as follows: In Section II we understand about Smart Tourism, while Section III presents the system architecture followed by section IV containing Algorithmic Strategy.

II. SMART TOURISM

A. *Smart Tourism*

"Smart now has become a buzzword to describe technologies that rely on sensors, connectivity, data and information exchange for economic, and social development. As a concept, smart is exploiting operational, near-real-time real-world information, data sharing and integration, and using complicated analytics, modeling, optimizing and visualizing to create better operational choices." [2]

The tourism trend has now shifted towards digital or called tourism 4.0. Tourism 4.0 is aimed at millennial tourists with multiple growth targets. This 4.0 tourism trend is marked by changes in tourist behavior that tends to be independent and individual. Through digital technology, consumer behavior begins to change in an increasingly mobile, personal and interactive direction. In paper [3] it is proposed as a smart trip planner to support independent travelers to facilitate his/her itinerary automatically.

B. *Related Works*

Tour route planning is a hot research issue of smart tourism.. According to common tour route planning methods and existing problems, a smart tour route planning algorithm based on clustering center motive iteration search is focused in this study. Based on individual tourist's needs, a tourist's temporary accommodation in an area is set as a clustering center to build optimal popular sight extracting algorithms. "Motive iteration interval and sub-interval are defined to build a one-way shortest path algorithm to output shortest path between clustering center and tourist sight and between two tourist sights." [3].

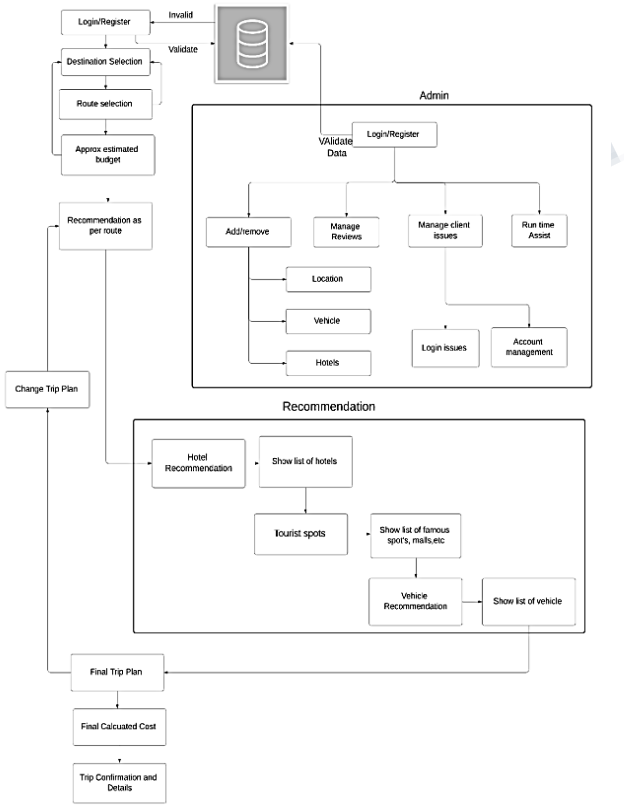
In [4] the author discusses improvement in the information to travelers of the transit network, here they also consider various factors such as network unreliability and presence of diversion where path decisions can be made. Also travelers need not to rely on the single option for selection of path, but they have to use a strategy or set of rules which will make users reach their destination with maximum utility.

In [5] the discussion is about an algorithm called Balanced Orienteering Problem which design trips for tourists. The proposed algorithm combined with a recommender system for tourist recommendations create an infrastructure for mobile application of the tourism guide which the paper is about.

In [6] the author discusses use of IoT and smartphones in Travel Route Recommendation. This paper talks about the system which discovers frequent travel routes from the generated pattern sequences by using an original route mining algorithm, named Tourist-Behavior Prefix Span. Here the proposed system collects raw inputs of frequent travel routes of users and then converts it into travel-based pattern sequence so that the system optimizes the results depending upon inputs received.

III. SYSTEM OVERVIEW

The following figure shows the system architecture of our web app.



A. *User Classes and Characteristics*

- User – User can Register, login, select trip destination and get recommendations.
- Admin – Can manage vehicles, hotels, locations and – Manage user reviews, feedback.
- Trip plan – Select Start and final destination,

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approximate budget, changing or updating plan.
- Map – Select Route, Places to visit.

B. Functional Requirements

User Authentication
- The User will have to login in to the web app.
- New User has to sign in to the web app.

Finalizing Destination with Maps
- Users will get to see an interactive map on which he/she can select places or destinations or routes.

Accommodation Recommendation
- System suggests best Hotels or xhostels according to the user based on the destination and route and budget.

History Based Recommendation
- Users will get recommendations about nearby Tourist attractions or famous places etc. based on other user's feedback or user's search history.

Chatbot
- Users will get virtual assistance and help using a chatbot.

C. Database

- Missing values should be minimal.
- Thus, the system must use RDBMS.
- For this implementation, we would use MySQL.

IV. ALGORITHMIC STRATEGY

We are using three types of recommendation systems for the described project. Namely:
- Content-based Filtering
- Hybrid Recommendation
- Collaborative Filtering

Content-based filtering is used to recommend similar items according to the user's previous actions and feedback and what the user likes.

A hybrid recommender system, which is a combination of two or more recommendation systems, here content-based and collaborative filtering are combined to recommend different tourist places and so on.

Collaborative filtering, another advanced recommendation system that is similar to the content-based recommendation is used to recommend nearby hotels, restaurants and similar places.

Project Flow:
- Users will login/register.
- Credentials will be saved.
- User will specify his interests.
- User will specify his budget and willing destination.
- System recommends appropriate details with maps.
- Users will take assistance from chat bot whenever required.
- User will finalize the plan.
- Confirmation from system by SMS/Email.
- Users will get run-time updates when they will proceed with the trip.
- Users can then give feedback about their experience.

V. CONCLUSION

The proposed system or web application will provide a complete solution for the tourist and casual travellers to plan and execute the entire travel plan with the help of recommendation systems like hybrid recommendation, content based filtering, collaborative filtering and overall with a good user interface in addition.

This Web Application will provide a facility for users to plan and execute their trips under a single roof and in a convenient way with good user interface. The application will be agile enough for users to edit and update travel details at runtime. This application will end the necessity of users to have multiple applications and accounts on various platforms. Also, this application covers the budget aspect of the travel planning in a smooth way.

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