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UNIVERSITY OF MUMBAI

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A Project Report on

Personalized itinerary recommendation system

Submitted in partial fulfillment of the degree of
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in
Computer Engineering

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1.Project Conception and Initiation

1.1. Abstract

- Problem of deciding a destination to travel to and planning an itinerary.
- We aim on recommending a destination based on minimal information from the user.
- Recommendation is based on few user attributes as well as external factors.
- The system interface optimizes user experience through a chatbot interface.
- The system generates an itinerary considering user input as well as the data available in the dataset.

1.2. Objectives

1. To make the process of trip planning hassle free and cost-effective.
2. To make it convenient for the users to pick a travel destination and itinerary of their choice.
3. To curate a travel plan according to the user’s preferences, making the user’s budget the centre of attention.
4. To ensure maximum accuracy through consideration of external factors.
5. To provide the best possible user experience.

1.3. Literature Review

- In the research paper *'Personalized Attraction Recommendation System' for Tourists Through Check-In Data*', the authors have focused on building a personalized recommendation system that outputs the most optimal travel destination as per the user's social network data.

- The project paper on *'Crowd Prediction System for Tourists'* proposes a solution for dynamically obtaining the crowd density in a particular tourist hotspot.

- The paper on *'Building a Spatially-Embedded Network of Tourism Hotspots From Geotagged Social Media Data'* the authors focus on building a network of tourist hotspot.

1.4. Problem Definition

To develop a user-friendly system that recommends a travel destination based on minimum user input and also generates a set of itinerary for the user to pick from.

1.5. Scope

- The system takes basic details from the user and utilizes the same along with stored external information to precisely recommend the most suitable destination in the country.
- The user interacts with the system through a chatbot
- The system also generates a set of itineraries for the user to choose from
- The system is confined to tourist hotspots in India

1.6. Technology stack

- Android Studio :
  - For development of chatbot system as an Android application.
- Ana chat
  - For chatbot agent.
- Jupyter Notebook
  - Mainly for portability of python code used in model generation.
- Django REST framework
  - Development of REST API.
- Scikit-learn
  - Development of destination recommendation module.

1.7. Benefits for environment & Society

- Eliminates travelling to travel agents
- Reduction in paper wastage
- Increases employment
- Provides financial support for the conservation of the ecosystem and natural resources management making the destination more reliable and desirable to visitor

2. Project Design

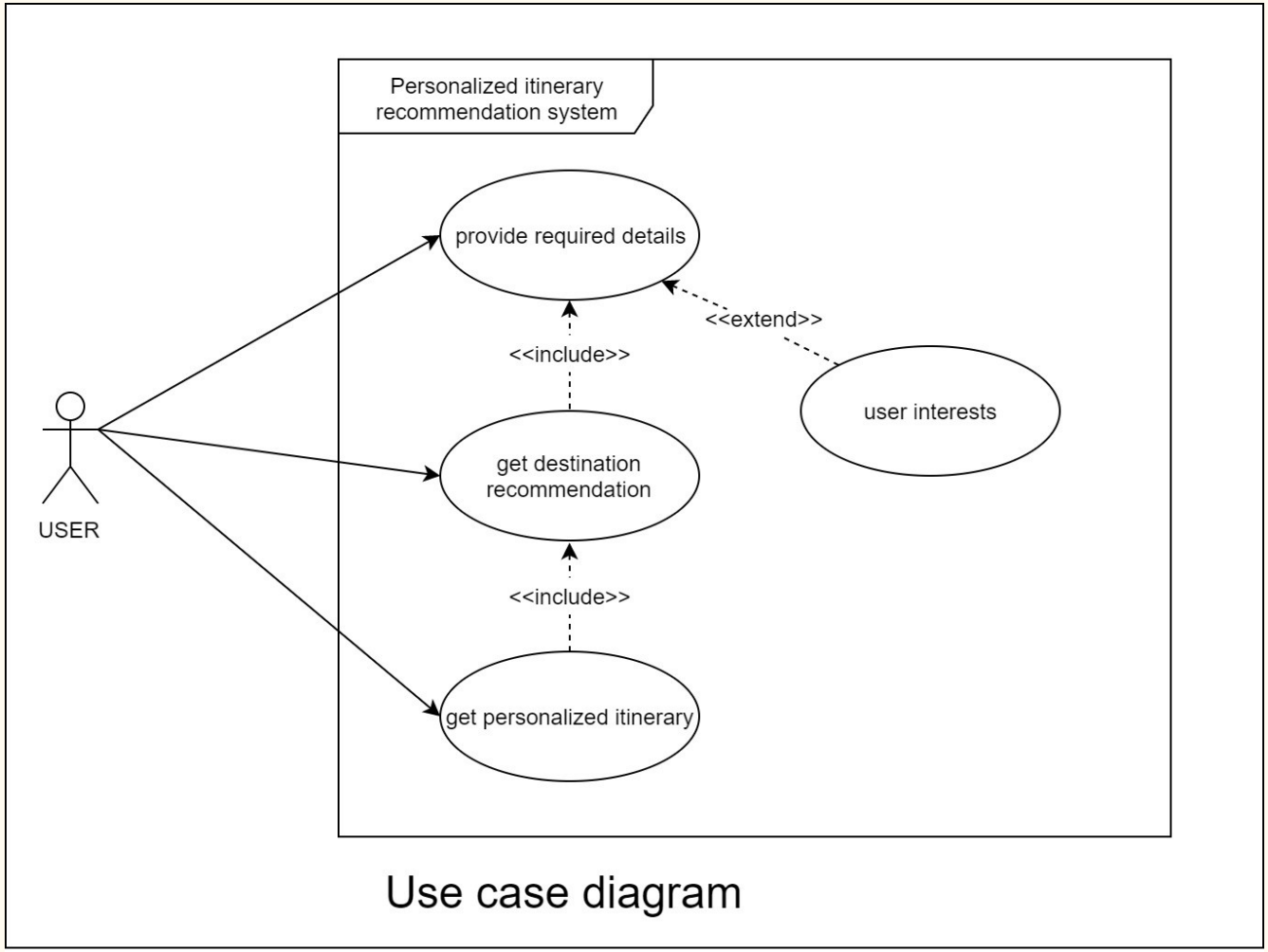
2.1. Proposed System

- System makes the planning phase of a vacation convenient.
- Recommends destination based on user attributes as well as external factors to provide maximum accuracy.
- Generates an array of itineraries for the recommended place, each for a different purpose/interest
- Human-like communication is possible with a chatbot interface

2.2. Design(Flow Of Modules)

- The entire project can be broadly classified into four main modules: the dataset, chatbot interface, destination recommender, and itinerary generator.
- Flow of modules:

  1. The interface interacts with user to obtain relevant data
  2. The data is sent to recommendation module
  3. The recommendation module utilizes dataset to process user input
  4. The result from recommendation module is displayed to the user
  5. The chosen place is sent to the itinerary generator module to get an array of itineraries
  6. Itineraries are displayed to the user to select one from

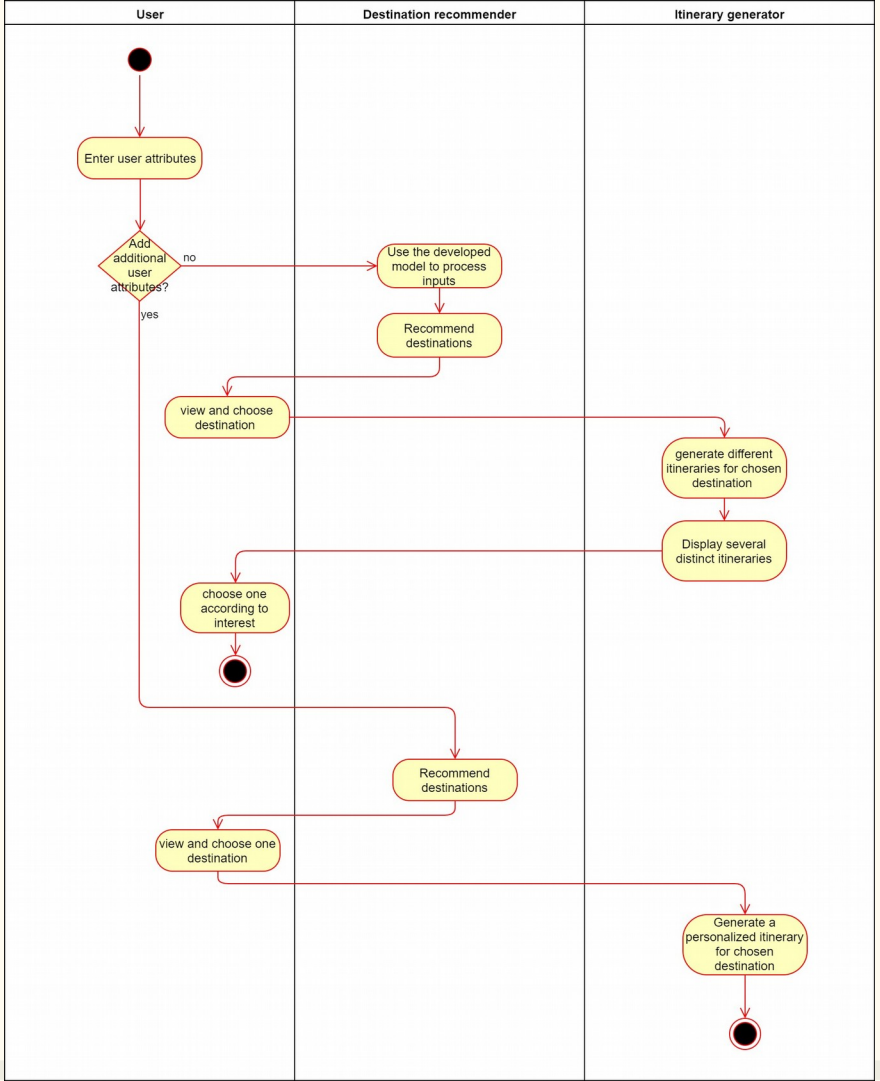


Use case diagram

2.3. Description Of Use Case

- Visual representation of the process that is required to get a travel recommendation.
- Helps visualize the functional requirements of the system.
- Actor is the tourist or user of the system
- User provides required attributes
- User can choose to provide additional preferences
- Multiple recommendations are made to the user
- Several itineraries are presented to the user

2.4. Activity diagram



2.5. Module-1 : The dataset

- Most crucial part of the system
- Utilized by the recommendation module as well as the itinerary generator module
- Acquired manually
- The dataset for the recommendation system is in the form of .csv files.
- Recommendation is based on tags assigned to a particular place

Module-2 : Destination recommendation system

- This module deals with taking the user details and processing them against a trained model to generate a cluster of recommendations to the user.
- This module uses the trained dataset and recommends a cluster of places to the user according to the user’s interest.
- The input is taken from the user through the chatbot interface and the resulting recommendations are also provided through the same interface.
- Instead of recommending only one place, the recommendation system recommends a number of places of similar type from which the users can choose the place of their interest.

Module-3 : Itinerary generator

- Final phase of the application.
- An array of itineraries are presented for the chosen place.
- Each itinerary focuses on a different genre.
- Only one itinerary will be generated, if user preference is provided

Module-4 : Chatbot UI

- Intermediate between the user and the system.
- Developed using Ana chat platform.
- User interacts with chatbot to provide relevant information.
- Utilizes REST API developed with Django REST framework for communication with recommendation and the itinerary generator module.

2.6. References

1. K. Kesorn, W. Juraphanthong and A. Salaiwarakul, "Personalized Attraction Recommendation System for Tourists Through Check-In Data," in IEEE Access, vol. 5, pp. 26703-26721, 2017.
2. X. Wu, Z. Huang, X. Peng, Y. Chen and Y. Liu, "Building a Spatially-Embedded Network of Tourism Hotspots From Geotagged Social Media Data," in IEEE Access, vol. 6, pp. 21945-21955, 2018.
3. Kartik Rajendra Kokane, Pratik Pradeep Jogdand and Rohit Dhuri, “Crowd Prediction System for Tourists”

3.Planning for next semester

Planning

- The next semester will be devoted to the development of itinerary generator module.
- This module will be integrate into the currently incomplete system to complete it.
- The development process will include:
  - Decoding the problem of itinerary generation
  - Data collection
  - Creation of a model to generate itinerary
  - Testing the module
  - Integration of this module into the system
  - Testing the system as a whole

Thank You