PADHARO SA

PROJECT SYNOPSIS

OF MAJOR PROJECT

BACHELOR OF TECHNOLOGY

Computer Science and Engineering

SUBMITTED BY

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Project Guide

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Proposed Topic: Padharo Sa: Unleashing the power of AI – to discover, plan and explore – tailoring travel experiences at fingertips

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Problem statement

The objective of this project is to develop a machine learning-based trip planner website that provides personalized recommendations to users based on their preferences and historical travel data. The current challenge faced by travellers is the overwhelming amount of information available when planning a trip, making it difficult to find relevant and personalized recommendations for attractions, hotels, and restaurants. The website aims to address this problem by leveraging machine learning algorithms to analyse user preferences, historical travel data, and other relevant information to generate tailored recommendations. By considering factors such as location, budget, travel dates, and interests, the system will offer optimized suggestions for attractions, accommodations, and dining options that align with the user's preferences. The goal is to simplify the trip planning process, save time, and enhance the overall travel experience by providing accurate and personalized recommendations.

Introduction

The project "AI-Powered Travel Recommendation and Itinerary Planning Platform" is a web-based application that harnesses the capabilities of artificial intelligence (AI) to revolutionize the way people plan their travel experiences. In an era characterized by the integration of modern technologies into our daily lives, this project aims to simplify and enhance the travel planning process for everyone. The platform's primary objective is to develop a machine learning-based trip planner website capable of providing highly personalized travel recommendations to users. The existing challenge faced by travellers is the overwhelming amount of information available when planning a trip, which can make it difficult to find relevant and tailored recommendations for attractions, hotels, and dining options. Our platform addresses this issue by leveraging machine learning algorithms to analyse user preferences, historical travel data, and other relevant information to generate personalized recommendations. It takes into account factors such as location, budget, travel dates, and user interests to offer optimized suggestions for attractions, accommodations, and dining options that align with the user's preferences. Ultimately, the goal is to save time, reduce decision-making stress, and elevate the overall travel experience by providing accurate and personalized recommendations. This project aspires to make travel simple, exciting, and memorable for all users, ensuring they spend less time worrying about details and more time enjoying their adventures. The platform functions as a smart travel friend in the modern world, making travel simple and unforgettable.

Rationale

While websites like TripAdvisor and Booking.com have established themselves as popular platforms in the travel industry, there are certain aspects where our ML-based travel website can potentially excel and offer a unique value proposition. Here are a few areas where our website can stand out:

1. Personalization and Recommendation Accuracy

2. Real-Time Weather Integration

3. Crowd Density Prediction

4. Multimodal Data Integration

5. Continuous Learning and Improvement

6. Seamless Integration of Booking and Planning

By focusing on these areas of differentiation, our ML-based platform can offer a more personalized, accurate, and comprehensive travel planning experience compared to existing platforms.

Objectives

1. Trip planning:

- Tour guiding steps (itineraries)
- Including destination attractions
- Resting and stoppage places

2. Suggesting Travel ideas*:*

- Based on user preferences
- Based on user's historical data
- Based on the time and season, etc.

3. Cultural promotion:

- Allows easier travel to exotic places
- Presents collection of places to visit based on user’s preferences

4. Crowd density analysis:

- Collects and stores data of places visited and the frequency
- Can be used to map preferences of people of different communities to places.

5. Integrating modern technologies with lives of people:

- Uses latest technological advancements and researches
- AI makes the work effortless

Data collection:

1. UP tourism year-wise, district-wise statistics: Year-wise Tourist Statistics | Welcome to UP Tourism-Official Website of Department of Tourism, Government of Uttar Pradesh, India

2. Indian tourism statistics: Market Research And Statistics | Ministry of Tourism | Government of India

3. UP region wise data of stays: COVR - Uttar Pradesh.DOC (tourism.gov.in)

4. Tourist places in different cities: Tourist Places | District Agra , Government Of Uttar Pradesh | India (same link, just change the name of district)

Frontend and user-interface:

1. Technologies:

- *3.js:* Three.js – JavaScript 3D Library (threejs.org)
- *parallax.js:* parallax.js (wagerfield.com)

2. Reference ideas:

- *Corn revolution:* Pioneer – Corn. Revolutionized. (resn.global)
- *Annoying museum (for website layout):* The Museum of Annoying Experiences | Home (zendesk.com)
- *Basic (aesthetic) homepage UI for a travel website:* Travelogy India ® - Gateway to Ultimate Traveling Experience !
- *(Can be used in the UI above) Moving cards like:* Free Website Builder | Create a Website in Minutes - GoDaddy IN

ML Algorithms:

1. *Clustering:* If you want to group places based on their similarities, clustering algorithms like K-means or DBSCAN can be useful. This can help identify regions with similar characteristics or groupings of places that are frequently visited together.
2. *Recommender Systems*: If you're aiming to recommend places to users based on their preferences or historical data, collaborative filtering or content-based recommendation algorithms can be employed.
3. *Graph algorithms:* If your roadmap involves optimizing paths and considering transportation networks, graph algorithms like Dijkstra's algorithm or A* search can help find the shortest or most efficient routes.
4. *Regression:* If you have numerical data and want to predict some value, regression algorithms like linear regression, decision trees, or random forests can be appropriate.
5. *Deep Learning:* For complex patterns and large-scale datasets, deep learning algorithms such as recurrent neural networks (RNNs) or convolutional neural networks (CNNs) might be suitable.

Literature Review

Title	Authors	Published	Source	Findings
A systematic review and research perspective on recommender systems [1]	Deepjyoti Roy and Mala Dutta	2022	Journal of Big Data	Systematic review of recommender systems and taxonomy.
Adaptive tourist recommendation system: conceptual frameworks and implementations [2]	Leila Etaati and David Sundaram	2014	Vietnam Journal of Computer Science	Proposal of an adaptive tourist recommendation system.
Using Weather Information to Improve Route Planning [3]	Paul Litzinger, Gerhard Nevratil, Ake Sivertun and Daniela Meier	2012	Conference: AGILE, 2012	Incorporating weather information in route planning algorithms.
A travel route recommendation algorithm with personal preference [4]	Ying Xu, Tao Hu and Ying Li	2016	12th International Conference on Natural Computation and 13th Fuzzy Systems and Knowledge Discovery (ICNC-FSKD), 2016.	Proposed algorithm can obtain better results in terms of the travelling distance and travelling time compared with other algorithms in the literature.
Location-Aware Personalized Traveler Recommender System (LAPTA) Using Collaborative Filtering KNN [5]	Mohanad Al-Ghobari, Amgad Muneer and Suliman Mohamed Fati	2021	Computers Materials & Continua, 69(2), 1553-1570	Experimental results showed that LAPTA could provide more reliable and accurate recommendations compared to the reviewed recommendation applications.

Feasibility Study

1. Technical Feasibility:

- *Technical Expertise:* Developing a machine learning-based recommendation system requires specialized skills in AI, data science, web development, and database management.
- *Data Availability:* Assessing the availability and quality of data required for training the recommendation system. Data sources for user preferences, historical travel data, and travel-related content should be identified and accessible.
- *Technology Stack:* Evaluating the feasibility of using specific technologies and tools for web development, machine learning, and data storage. Ensuring they are robust and well-suited for the project's requirements.

2. Economic Feasibility:

- *Budget:* A comprehensive budget that includes costs for development, hosting, data acquisition, marketing, and ongoing maintenance.

3. Operational Feasibility:

- *Team Availability:* Ensuring that the project team, including developers, data scientists, and designers, is available and committed to the project's timeline.
- *Resource Allocation:* Allocation resources efficiently, including human resources, computing infrastructure, and data storage.
- *User Adoption:* Analysis of the willingness of users to adopt the platform. Conduction of surveys or focus groups to gauge user interest and gather feedback.

4. Scheduling Feasibility:

- *Project Timeline:* Developing a detailed project timeline that includes key milestones, development phases, testing, and deployment. Ensuring that the project can be completed within a reasonable timeframe.
- *Risks and Contingencies:* Identifying potential risks and challenges that could delay the project. Development of contingency plans to mitigate these risks.

5. Legal and Ethical Considerations:

- *Data Privacy:* Ensuring compliance with data privacy regulations, such as GDPR or CCPA, by implementing robust data protection measures.
- *Content Licensing:* Addressing legal aspects related to content licensing, especially if using third-party data sources.

6. Market Research:

- *Competitive Analysis:* Assessing competitors in the travel planning space, focusing on their features, user base, and monetization strategies.
- *Target Audience:* Understanding the demographics and preferences of the target audience. Tailor the platform to meet their needs.

Methodology/Planning of work

SEMESTER – 4

- Project initiation and planning
- Data collection and preparation
- Learning technologies

SEMESTER – 5

- ML Model Development
- User Interface design and Frontend development

SEMESTER – 6

- Backend development
- Testing and quality assurance
- Deployment and launch

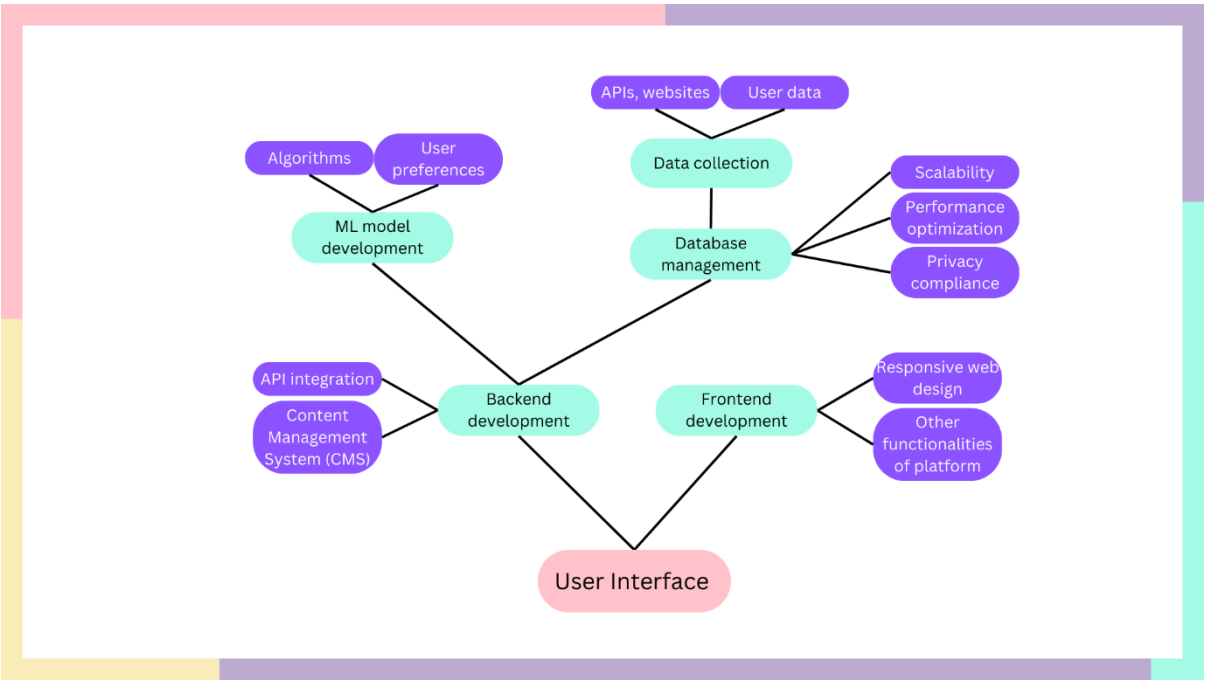

Fig.(1): Flow of work

Facilities required

- Speedy internet connection
- Suitable courses for the technologies required
- A dedicated development team
- Adequate time for development of project
- Datasets for the learning and testing of models

Expected outcomes

The feasibility study for the Padharo Sa project indicates that it is technically, economically, and operationally viable. The availability of technical expertise, data sources, and potential revenue streams supports the project's feasibility. However, successful execution will require careful planning, resource allocation, and risk management. The next steps should include detailed project planning, resource procurement, and development commencement.

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Research papers:

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[7] Saad, S. & Saberi B. (2017). Sentiment Analysis or Opinion Mining: A Review. *International Journal on Advanced Science, Engineering and Information Technology, 7(5), 1660-1666.* DOI: 10.18517/ijaseit.7.5.2137

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