

Project Report on

" Build a tourism recommender system that suggests points of interest based on a user's location and preferences."

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ABSTRACT

India's diverse tourism offerings, from the majestic Himalayas to the vibrant cities and spiritual hubs, have spurred significant growth in the country's tourism industry. This study introduces a pioneering tourism guiding system utilising **Quantum Geographic Information System (QGIS)** technology. Comprising five integrated modules, it offers personalised and professional services akin to knowledgeable tour guides, tailored to varying tourist preferences and needs. By harnessing QGIS capabilities, the system delivers spatial insights, enriching visitor experiences and deepening understanding of India's tourism dynamics.

With its potential to revolutionise the sector, the system promises to elevate visitor experiences while providing invaluable insights for tourism development and management, ultimately contributing to sustainable growth.

The system, comprising five integrated modules, simulates the expertise of a knowledgeable tour guide, catering to diverse tourist preferences and needs at local, regional, and international levels. By leveraging QGIS capabilities, the system provides spatial insights that enrich the tourist experience and contribute to a deeper understanding of India's tourism dynamics.

INTRODUCTION

The tourism industry has experienced unprecedented growth in recent years, with an increasing number of travellers seeking unique and personalised experiences. The rise of social media and travel blogging has fueled this trend, with travellers eager to discover new destinations and share their adventures with others. However, navigating unfamiliar destinations and discovering points of interest that align with individual preferences can be a daunting task. The abundance of options and information overload can lead to frustration and missed opportunities. Traditional travel guides and recommendation systems often fall short in meeting the diverse needs of modern travellers. They may provide generic suggestions that fail to account for individual preferences, interests, and location. Moreover, they may prioritise popular attractions over hidden gems, neglecting the unique character and cultural heritage of a destination. To address these limitations, a tourism recommender system can play a vital role in enhancing the travel experience.

A tourism recommender system can suggest points of interest based on a user's location and preferences, considering factors like distance, ratings, and historical significance. Such a system can help travellers discover hidden gems, optimise their time, and create unforgettable memories. Moreover, it can also contribute to the sustainable development of the tourism industry by promoting local businesses and cultural heritage. Recent advances in geographic information systems (GIS) and spatial analysis have made it possible to develop sophisticated recommender systems that integrate geospatial data and user preferences. QGIS, a popular open-source GIS platform, offers a robust set of tools and functionalities for spatial analysis and mapping. By leveraging QGIS and its extensive library of plugins and scripts, we can develop a tourism recommender system that is both spatially aware and user-centric. The integration of QGIS with other data sources, such as social media, user reviews, and travel blogs, can provide a comprehensive understanding of a destination's attractions and experiences. By analyzing user behavior and preferences, we can create a system that learns from user interactions and adapts to their needs. Moreover, the use of QGIS enables us to visualize and map the recommendations, providing users with a clear and intuitive understanding of the suggested points of interest.

This project aims to develop a comprehensive tourism recommender system that integrates QGIS and multiple data sources to provide personalized suggestions for points of interest. By leveraging the spatial analysis capabilities of QGIS and the power of machine learning algorithms, we can create a system that is both efficient and effective. Our goal is to design a user-friendly and intuitive platform that empowers travelers to explore new destinations with confidence and excitement. Through this project, we aspire to make a meaningful impact on the tourism industry and contribute to the creation of unforgettable travel experiences.

LITERATURE SURVEY

Literature survey for building a tourism recommender system focusing on points of interest based on user location and preferences, incorporating factors like distance, ratings, and historical significance:

1. "Tourism Recommendation System based on Collaborative Filtering and Location-based Services" by Sachi Mohanty, Ranjan Kumar Dash, and Swati Lipsa.
2. "An Enhanced Collaborative Filtering Technique for Tourism Recommendation Systems" by Prof. P. A. Manjare, Miss P. V. Ninawe, Miss M. L. Dabhire, Miss R. S. Bonde, Miss D. S. Charhate, and Miss M. S. Gawand.
3. "A Hybrid Recommender System for Tourist Attraction based on Collaborative Filtering and Content-based Filtering" by Owaied H.H and Madhusree Kuanr.
4. "Personalised Tourism Recommendation System using Collaborative Filtering" by Farhan H.A, Nidal Hawamdeh, and Al-Okialy N.

These papers likely discuss methodologies combining collaborative filtering with location-based services, enhanced techniques for recommendation accuracy, and personalised recommendation approaches tailored to the tourism domain.

PROBLEM STATEMENT

The development of a tourism recommender system poses a complex challenge, requiring the integration of multiple data sources and factors to provide personalized suggestions for points of interest to users based on their current location and preferences. The system must efficiently process and analyze large amounts of data, considering factors such as distance, ratings, reviews, and historical significance, to provide accurate and relevant recommendations that align with user interests and constraints. Furthermore, the system should adapt and learn from user feedback over time to continuously improve the recommendations offered, enhancing the user's tourism experience by introducing them to new and historically significant places of interest.

GOALS

1. Develop an innovative and user-centric location-based recommendation system tailored to the unique needs of tourists exploring India.
2. Enhance the overall tourist experience by providing personalized recommendations that match individual preferences, interests, and travel itineraries.
3. Utilize Geographic Information Systems (GIS) technology to integrate spatial data and create a dynamic platform for tourist recommendations across India.
4. Foster sustainable tourism practices by promoting off-the-beaten-path destinations and reducing overcrowding at popular tourist attractions.
5. Improve accessibility to relevant information for tourists, including attractions, accommodations, dining options, transportation, and cultural events.
6. Empower tourists to make informed decisions through real-time updates, interactive maps, and user-generated content within the recommendation system.
7. Collaborate with local stakeholders, including tourism boards, businesses, and communities, to ensure the accuracy and relevance of recommended destinations and services.
8. Leverage machine learning algorithms and data analytics to continuously optimize recommendation accuracy and user satisfaction.
9. Explore opportunities for cross-cultural exchange and enrichment by incorporating cultural heritage sites, festivals, and traditions into the recommendation system.
10. Facilitate economic growth and socio-cultural exchange by connecting tourists with local businesses and artisans, thus supporting the livelihoods of communities in India.

OBJECTIVES

1. Conduct a comprehensive literature review to identify key trends, challenges, and best practices in location-based recommendation systems and GIS applications in the tourism sector.
2. Gather and analyze spatial data from diverse sources, including government databases, travel websites, social media platforms, and crowd-sourced information, to create a robust database of tourist attractions and amenities in India.
3. Develop algorithms for personalized recommendation generation, considering factors such as user preferences, demographics, travel history, and real-time contextual data.
4. Design an intuitive and user-friendly interface for the recommendation system, incorporating features such as interactive maps, search filters, reviews, ratings, and social sharing functionalities.
5. Implement data privacy and security measures to protect user information and ensure compliance with relevant regulations, such as GDPR and India's data protection laws.
6. Conduct usability testing and iterative design iterations to optimize the user experience and accessibility of the recommendation system across different devices and platforms.
7. Collaborate with tourism industry stakeholders to validate the accuracy and relevance of recommended destinations, accommodations, and services through expert reviews and feedback.
8. Utilize machine learning techniques, such as collaborative filtering, content-based filtering, and reinforcement learning, to improve recommendation accuracy and adaptability over time.
9. Evaluate the impact of the recommendation system on tourist behavior, including travel patterns, spending habits, satisfaction levels, and engagement with local communities and cultural experiences.
10. Disseminate research findings through academic publications, conference presentations, and stakeholder workshops to facilitate knowledge sharing and foster innovation in the field of location-based tourism recommendations.

METHODOLOGY

1. Data Collection and Preparation:

- Collect four datasets pertaining to tourism: City, Places, User History, and User Info.

Datasets:

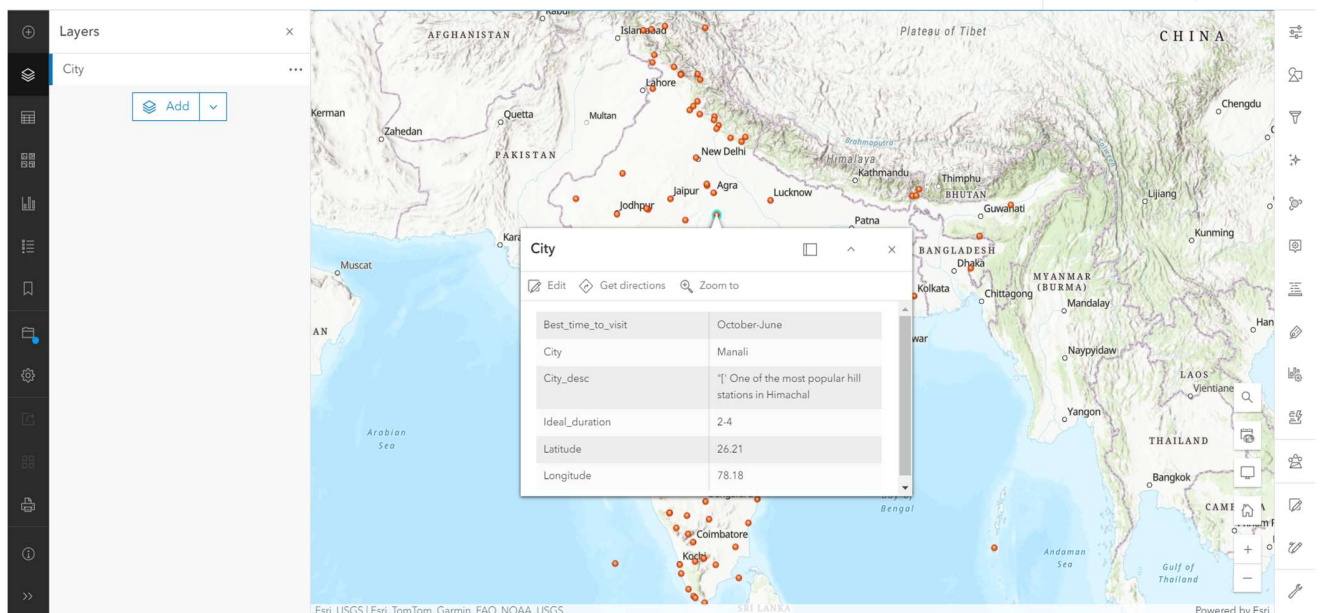
1.City: DestinationID |Name | State | Type | Popularity | BestTimeToVisit

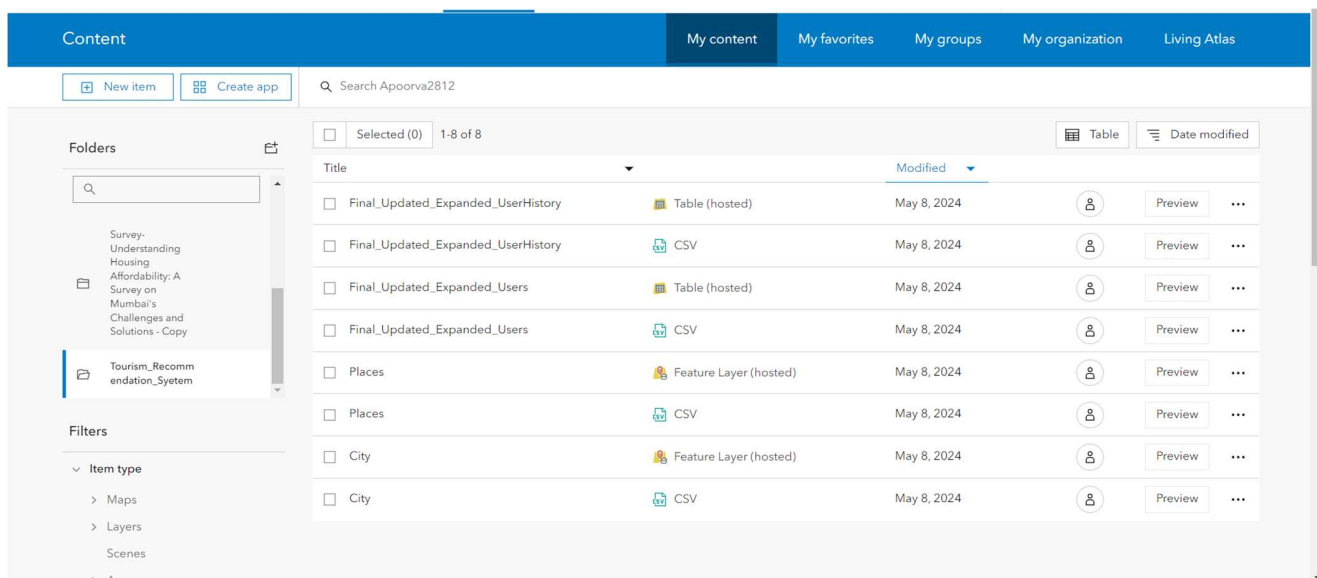
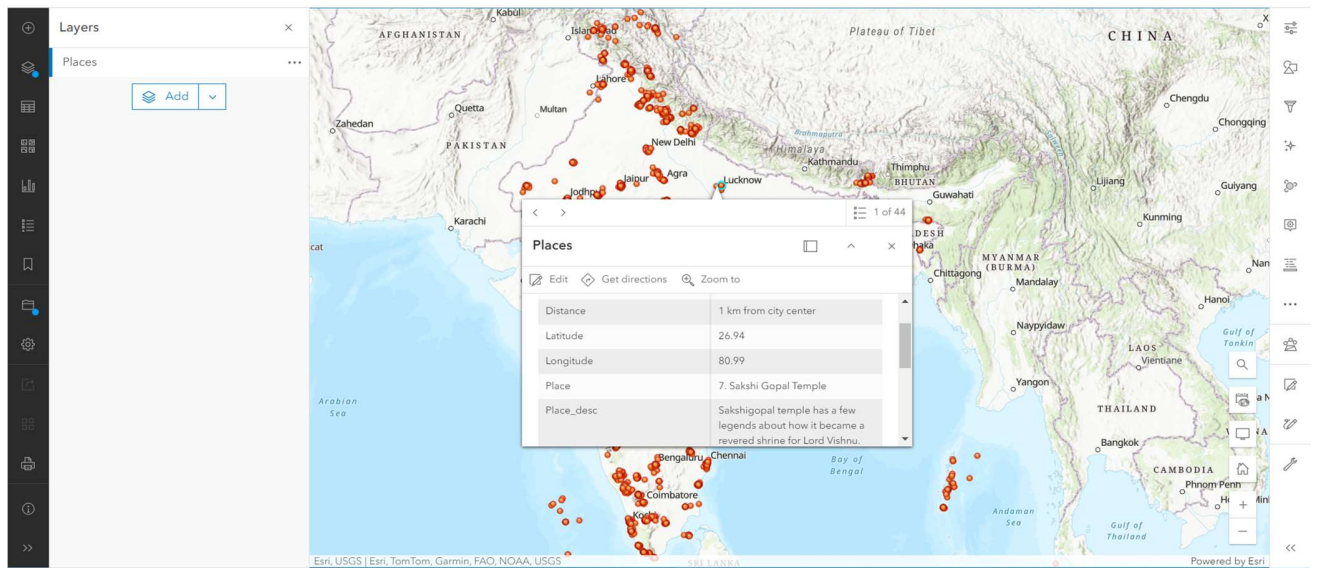
2.Places: ReviewID | DestinationID | UserID |Rating |ReviewText

3.User history: HistoryID |UserID |DestinationID |VisitDate |ExperienceRating

4.User info: UserID |Name |Email |Preferences |Gender |NumberOfAdults |NumberOfChildren

- Ensure data quality by conducting checks for accuracy, completeness, and consistency.
- Upload datasets to ArcGIS Online and create feature layers and tables.
- Merge datasets using unique identifiers (DestinationID and UserID) to facilitate comprehensive analysis.

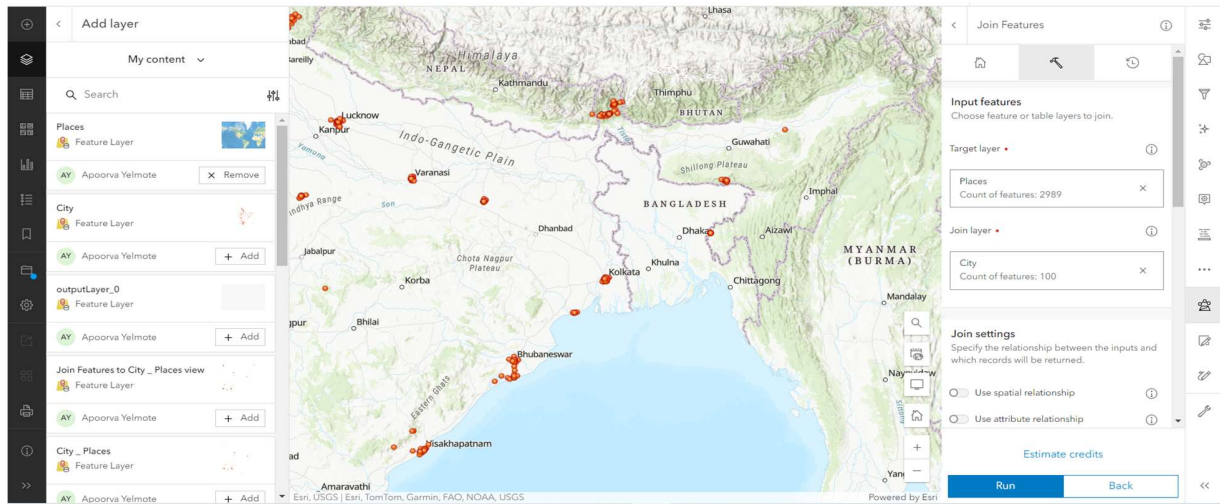




Display Name	Field Name	Type
<input type="checkbox"/> OBJECTID	OBJECTID	Integer
<input type="checkbox"/> HistoryID	HistoryID	Integer
<input type="checkbox"/> UserID	UserID	Integer
<input type="checkbox"/> DestinationID	DestinationID	Integer
<input type="checkbox"/> VisitDate	VisitDate	Date
<input type="checkbox"/> ExperienceRating	ExperienceRating	Integer
<input type="checkbox"/> Name	Name	String
<input type="checkbox"/> Email	Email	String
<input type="checkbox"/> Preferences	Preferences	String
<input type="checkbox"/> Gender	Gender	String
<input type="checkbox"/> NumberOfAdults	NumberOfAdults	Integer
<input type="checkbox"/> NumberOfChildren	NumberOfChildren	Integer
<input type="checkbox"/> Place	Place	String
<input type="checkbox"/> Type	Type	String
<input type="checkbox"/> Latitude	Latitude	Double

2. Data Joining and Analysis:

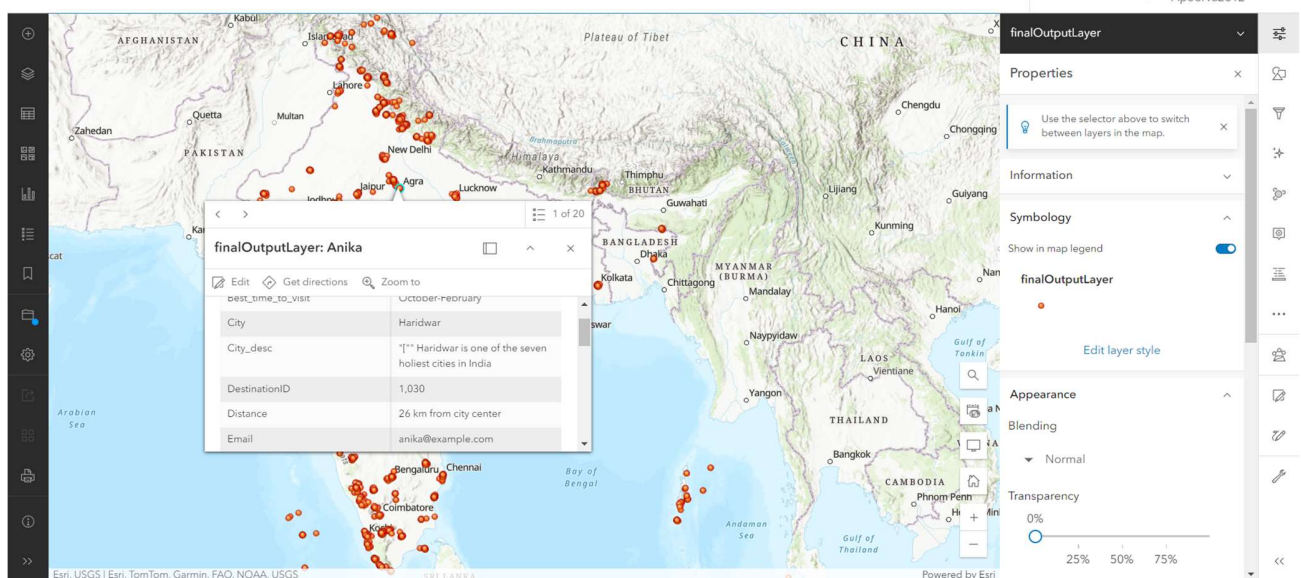
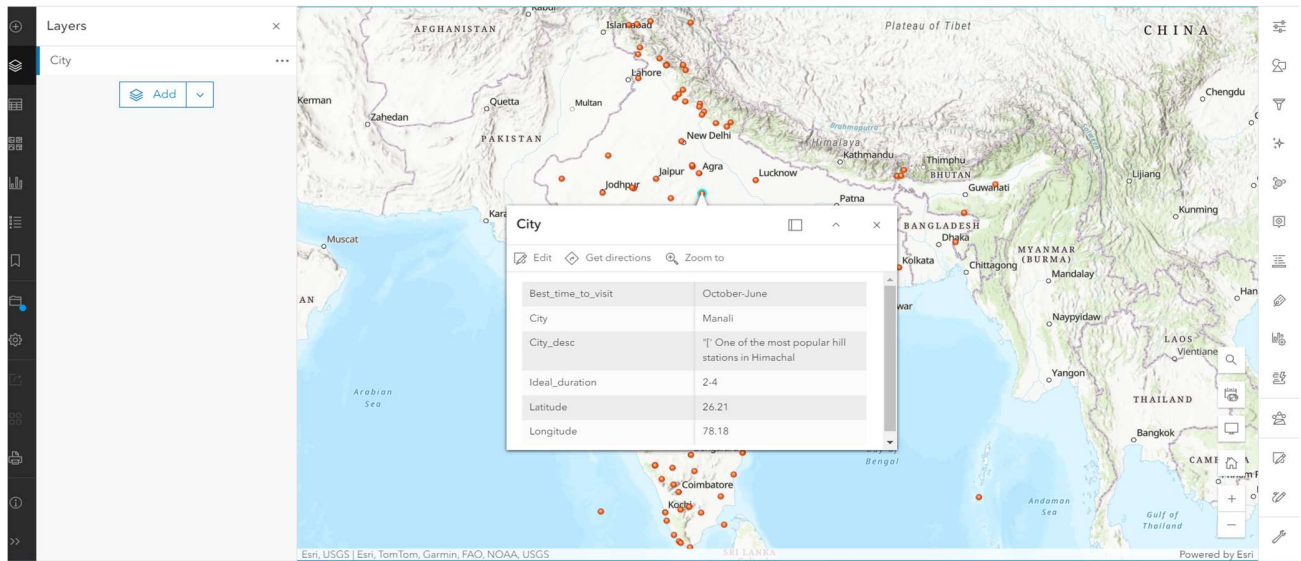
- Employ spatial indexing techniques to optimize spatial queries.
- Join City and Places datasets using DestinationID to associate points of interest with their respective cities.
- Merge User History dataset with the combined City and Places dataset using DestinationID to incorporate user visitation history and experience ratings.
- Merge User Info dataset with the merged dataset using UserID to incorporate user preferences and demographics.



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Clipboard			Font			Paragraph			Alignment			Number			Formatting - Table			Styles			Cells			Editing					
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1	OBJECTID	Histor	UserID	Destin	VisitDate	Experience	Name	Email	Preferences	Gender	Number	Numb	Place	Type	Latitude	Longitude	Rating	Distance	Place_desc	City	Ideal_dura	Best_time	City_desc						
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3	2	201	888	805	3/20/2024	2	Riya	riya@exan	City, Historical	Female	2	0	48. Quuvv	Adventure	18.75572	73.40908	3.2	16 km from	Located withi	Delhi	03-May	OctoberM	! The capital of Ind						
4	3	2	184	532	2/15/2024	5	Ishaan	ishaan@ei	Beaches, Histori	Male	1	2	11. Elliot's	Beach	30.11656	78.31861	4.2	7 km from	A beach show	Chennai	02-Mar	Nov-Feb	! Formerly know						
5	4	3	897	786	3/20/2024	2	Pooja	pooja@ex	City, Historical	Female	1	2	29. Pick th	Historical	18.77021	73.36709	3.1	10 km from	Vibrantly colo	Delhi	03-May	OctoberM	! The capital of Ind						
6	5	4	470	660	2/15/2024	1	Arjun	arjun@ex	Nature, Adventu	Male	2	1	25. Kutta	Adventure	31.10481	77.1734	3.4	61 km from	Kutta is a	Coorg	02-Mar	September	! Located amidst in						
7	6	5	989	389	2/15/2024	4	Ritvik	ritvik@ex	Nature, Adventu	Male	2	1	1. Lingaraj	Nature	10.0097	77.10416	4.2	7 km from	The Lingaraj	Bhubanes	01-Feb	Nov-Mar	! Bhubaneswar						
8	7	6	266	394	3/20/2024	3	Vivaan	vivaan@ei	Nature, Adventu	Male	2	1	6. Bindu S	Nature	10.08893	77.02592	3.4	6 km from	The Bindu Sarc	Bhubanes	01-Feb	Nov-Mar	! Bhubaneswar						
9	8	7	399	953	2/15/2024	2	Dhruv	dhruv@ex	City, Historical	Male	1	1	14. Gulmai	City	25.26951	83.02509	3.3	4 km from	The Gulmarg E	Gulmarg	01-Feb	Nov-Feb	! Situated at an						
10	9	8	869	901	2/15/2024	4	Karan	karan@ex	Nature, Adventu	Male	1	1	14. Go Shc	Historical	32.53874	75.971	3.7	2 km from	For carrying b	Goa	03-Jul	November	! Lying on the w						
11	10	202	353	894	2/15/2024	5	Isha	isha@exar	Nature, Adventu	Female	2	0	7. Chapori	Nature	32.5558	76.06558	3.7	16 km from	Chapora Fort	Goa	03-Jul	November	! Lying on the w						
12	11	203	367	912	2/15/2024	4	Aanya	aanya@ex	Beaches, Histori	Female	1	0	25. Relax	Beach	32.53874	75.971	3.2	58 km from	Paleolem Beac	Goa	03-Jul	November	! Lying on the w						
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15	14	204	593	775	3/20/2024	1	Kavya	kavya@ex	Nature, Adventu	Female	1	0	18. Gurudh	Adventure	18.75572	73.40908	3.9	5 km from	Gurudwara Ba	Delhi	03-May	OctoberM	! The capital of Ind						
16	15	205	79	493	2/15/2024	4	Dhruv	dhruv@ex	Beaches, Histori	Male	2	0	23. Museu	City	30.11277	78.31216	3.2	2 km from	Showcasing th	Chandigarh	01-Feb	Apr-Jun	! Chandigarh is						
17	16	11	522	97	2/15/2024	2	Kavya	kavya@ex	City, Historical	Female	2	0	2. Ana Sag	Beach	34.15143	77.57256	4.5	3 km from	Ana Sagar is a	Ajmer	01-Feb	Apr-Jun	! Surrounded by Ar						
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19	18	206	962	565	2/15/2024	3	Saanvi	saanvi@ex	Nature, Adventu	Female	2	1	44. Anjane	Adventure	9.519576	76.31208	3.2	10 km from	Viswaroopaa	A Chennai	02-Mar	Nov-Feb	! Formerly know						
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21	20	13	469	715	2/15/2024	3	Ishaan	ishaan@ei	Beaches, Histori	Male	2	0	18. Monas	Adventure	11.4102	76.69503	3.3	3 km from	You must visit	Darjeeling	02-Mar	Nov-Feb	! The previous sum						
22	21	208	539	684	2/15/2024	1	Aarav	aarav@ex	Nature, Adventu	Male	1	2	15. Cham	Nature	11.4102	76.69503	3.3	14 km from	This medieval	Dalhousie	02-Mar	Apr-Jun	! Dalhousie is a po						
23	22	14	46	487	2/15/2024	1	Anika	anika@ex	Beaches, Histori	Female	2	1	17. Tank N	Beach	30.12638	78.33006	3.2	2 km from	The Tank Mon	Chandigarh	01-Feb	Apr-Jun	! Chandigarh is						
24	23	15	98	617	3/20/2024	5	Arjun	arjun@ex	Nature, Adventu	Male	2	0	9. Nilgiri B	Beach	29.37253	79.42854	3.7	24 km from	Established in	Coimbat	01-Feb	Oct-Mar	! Often termed						
25	24	209	298	901	2/15/2024	2	Riya	riya@exan	Beaches, Histori	Female	1	2	14. Go Shc	Historical	32.53874	75.971	3.7	2 km from	For carrying b	Goa	03-Jul	November	! Lying on the w						
26	25	210	814	853	3/20/2024	5	Aditya	aditya@ex	Beaches, Histori	Male	1	2	8. Old Dig	City	10.23436	77.48633	4.7	1 km from	Old Digha Bea	Digha	01-Feb	Nov-Feb	! Beach town situa						
27	26	16	45	925	2/15/2024	4	Tamvi	tanvi@ex	City, Historical	Female	2	0	38. Grand	Adventure	22.4542	78.44619	4.7	17 km from	Originally kno	Goa	03-Jul	November	! Lying on the w						
28	27	17	424	893	2/15/2024	2	Riya	riya@exan	Beaches, Histori	Female	1	0	6. Adventu	City	32.51966	76.03537	4.4	13 km from	Anjana Beach	Goa	03-Jul	November	! Lying on the w						
29	28	211	211	714	2/15/2024	3	Anika	anika@ex	Beaches, Histori	Female	2	2	17. Obsen	Nature	11.40369	76.69363	3.3	1 km from	Like most oth	Darjeeling	02-Mar	Nov-Feb	! The previous sum						
30	29	212	746	807	2/15/2024	5	Pooja	pooja@ex	Nature, Adventu	Female	2	1	50. Nichol	Beach	18.76361	73.48153	4.7	1 km from	Situated in the	Delhi	03-May	OctoberM	! The capital of Ind						
31	30	18	352	149	3/20/2024	5	Kavya	kavya@ex	Beaches, Histori	Female	1	0	2. Marari	Nature	11.84701	93.01561	4.6	23 km from	One of the gre	Alleppey	01-Feb	Apr-Jun	! Officially called A						

3. Map Creation and Publication:

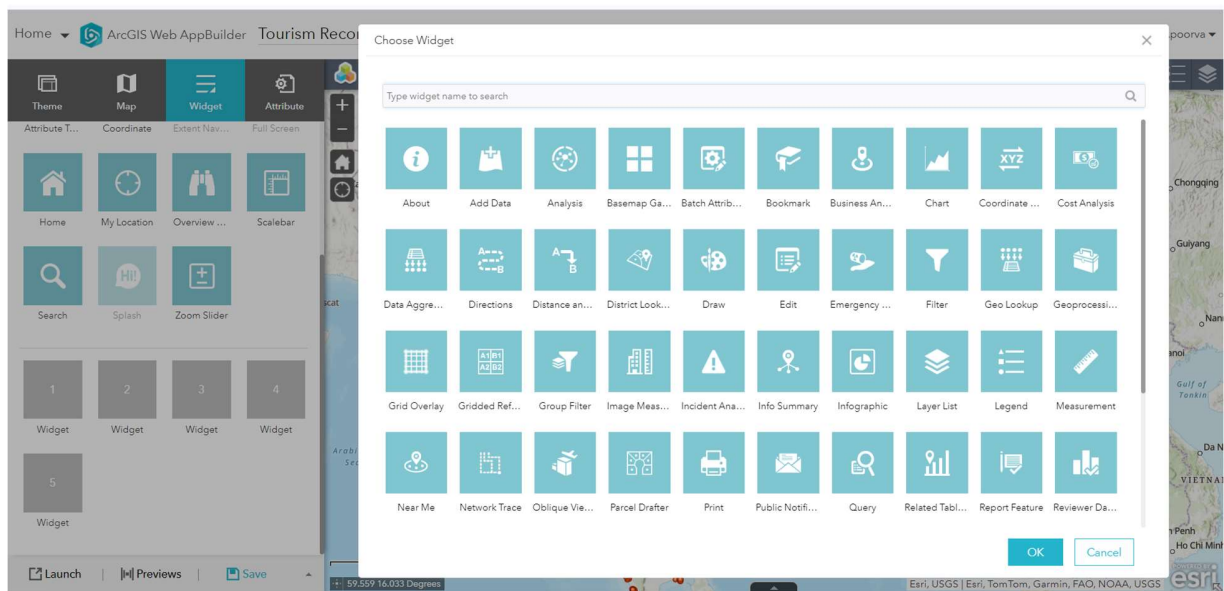
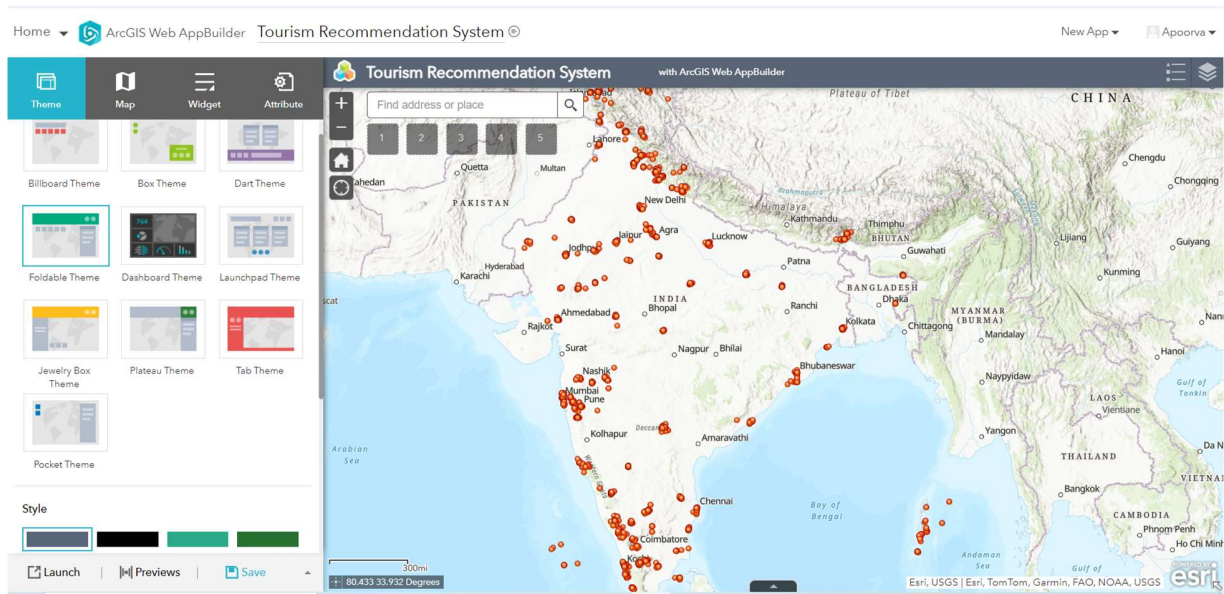
- Plot the merged dataset on a map using the Map Viewer in ArcGIS Online.
- Configure symbology and pop-ups to display relevant information about points of interest, including ratings, reviews, and user feedback.
- Publish the map to make it accessible to users through the web app.



4. Web App Development:

- Utilize the ArcGIS Web AppBuilder to create a user-friendly web app.
- Integrate user interface elements for inputting current location, such as a geolocation button for automatic detection or a manual input field.
- Implement functionality to display the nearest points of interest to the user's location, sorted by distance in ascending order.

- Provide detailed information about each recommended location, including ratings, reviews, and directions for reaching the destination.
- Offer options for exploring different travel modes (e.g., walking, driving) and estimated time and distance to reach each destination.



5. Testing and Validation:

- Conduct thorough testing of the web app to ensure all features function correctly across different devices and web browsers.
- Verify the accuracy of recommendations by comparing them against known data or user feedback.
- Gather feedback from test users to identify any usability issues or areas for improvement.

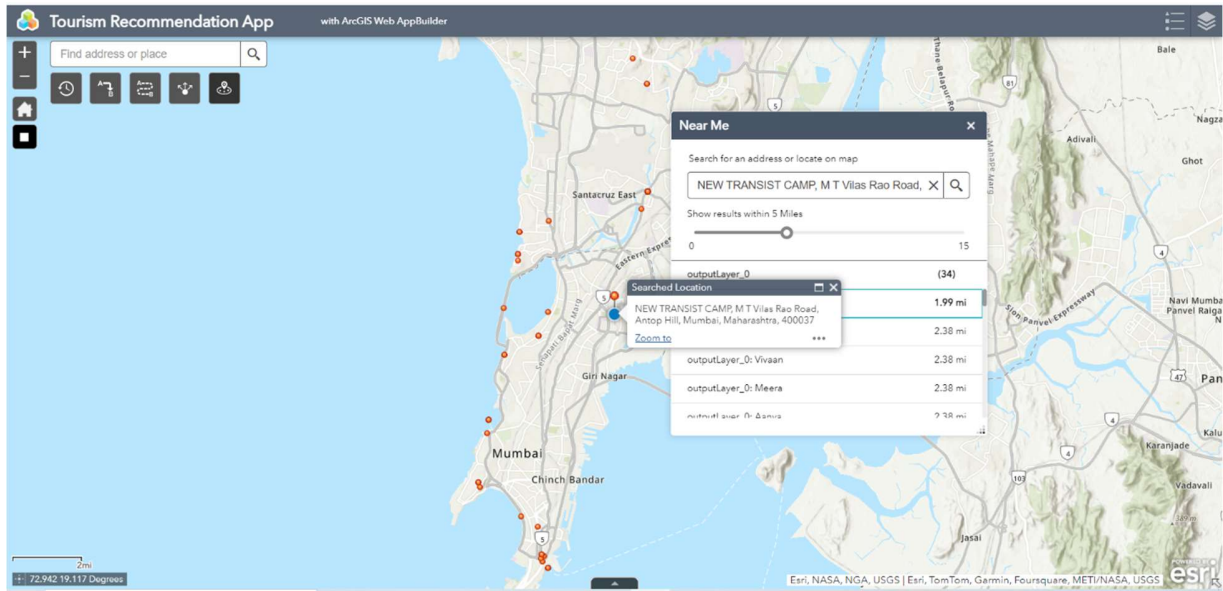
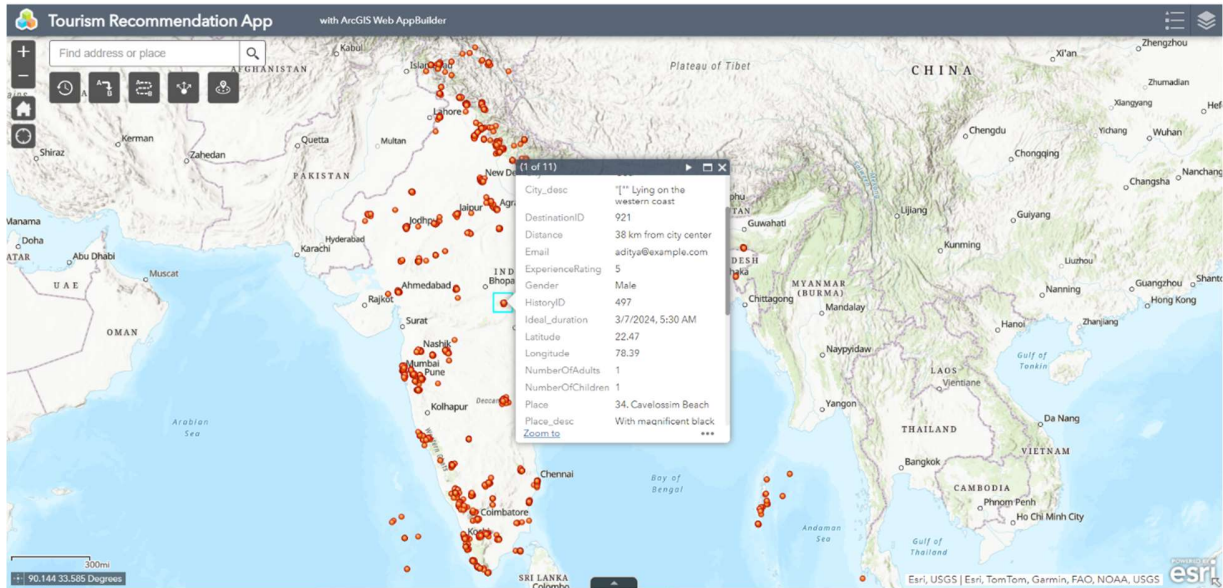
6. Deployment and User Engagement:

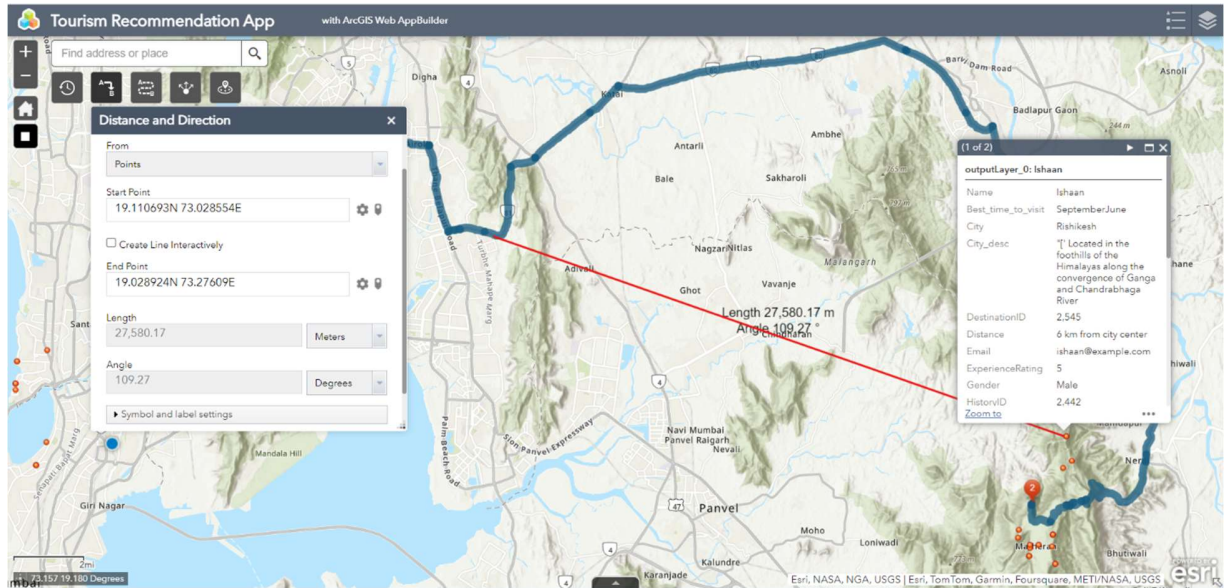
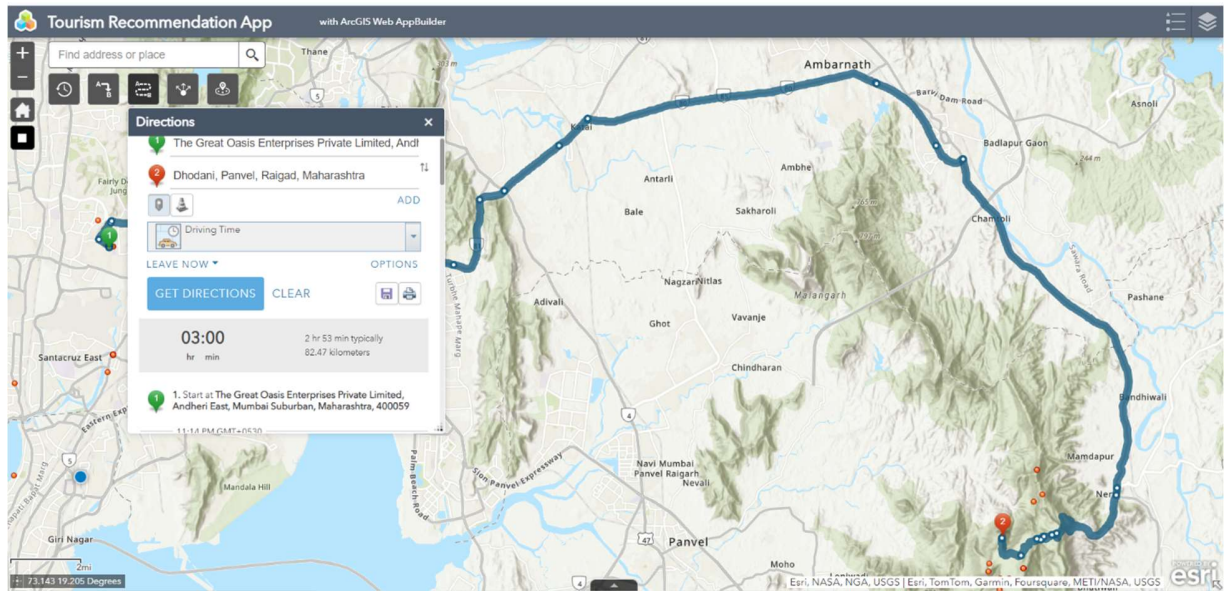
- Deploy the web app to make it accessible to users.

Project Link :

<https://vjti0de1e7300517.maps.arcgis.com/apps/webappviewer/index.html?id=47c052c096fe4f4baaa94c7c755fbc0e>

RESULTS :





CONCLUSION

The development and implementation of location-based recommendation systems for tourists, particularly in the context of India, offer significant potential to enhance the overall tourist experience and promote sustainable tourism practices. Through the integration of Geographic Information Systems (GIS) and advanced data mining algorithms, such systems can provide personalized recommendations tailored to individual preferences, interests, and travel itineraries. The utilization of techniques such as pattern matching, clustering, association, and collaborative filtering enables the extraction of valuable insights from vast amounts of spatial data, empowering tourists to discover new destinations, accommodations, and experiences with ease. By leveraging user preferences, profiles, and feedback, these recommendation systems can dynamically adapt and evolve, ensuring relevance and accuracy in their suggestions.

Furthermore, the convergence of knowledge-based systems with GIS and emerging technologies like extended reality (XRM) presents exciting opportunities for innovation and collaboration across various domains, including tourism, business, and media arts. This integration enhances the use of information technology in diverse fields, facilitating more immersive and interactive experiences for users. It's important to acknowledge the ongoing evolution of recommendation systems in the tourism sector, with a focus on enriching personalized recommendations through user-generated content and real-time feedback mechanisms. By capturing the opinions and experiences of both tourists and local users, these systems can provide valuable insights into destinations, attractions, accommodations, and local products, thereby enriching the overall journey for travelers.

In summary, recommendation systems play a vital role in guiding tourists towards memorable and fulfilling experiences while also contributing to the economic growth and cultural enrichment of destinations. As technology continues to advance and user expectations evolve, there remains immense potential for further innovation and refinement in location-based recommendation systems, ultimately enhancing the global tourism landscape.

FUTURE SCOPE

The research presented in this paper demonstrates the potential of location-based recommendation systems (RS) to enhance the tourism sector by providing personalized and timely recommendations to travelers. Building upon this foundation, there are several avenues for future research and development to further enrich the capabilities and effectiveness of RS in tourism:

1. Expansion to All States of India: While the proposed system focuses on recommending tourist sites within India, future work could extend its coverage to include all states of India, thereby offering a comprehensive and tailored experience for travelers across the country. This expansion would require additional data collection and analysis to ensure accuracy and relevance.

2. Integration of Itinerary Planning: To enhance the overall travel experience, future iterations of the recommendation system could incorporate itinerary planning functionalities. By considering factors such as travel time, distance between sites, and user preferences, the system could suggest optimized travel routes and schedules, along with recommendations for dining and shopping options along the way.

3. Development of Group Recommendation Systems: Recognizing the growing trend of group travel, particularly among friends, families, and tour groups, future research could focus on developing location-based group recommendation systems. These systems would leverage the interests and preferences of multiple travelers to generate collaborative recommendations for shared experiences and activities.

4. Integration of Climate and Time-based Recommendations: To further enhance the relevance and usefulness of recommendations, future iterations of the system could incorporate climate and time-based factors. By considering weather conditions, time of day, and seasonal variations, the system could offer tailored suggestions for activities, attractions, and dining options that align with current environmental conditions and traveler preferences.

5. Mobile Application Development: Given the widespread use of mobile devices among travelers, there is a significant opportunity for the development of mobile applications that leverage location-based recommendation systems. Future applications could address issues such as location positioning technologies, query processing, cache management, location tracking, weather recommendations, and social media integration, thereby offering a seamless and immersive travel experience for users.

6. User Engagement and Feedback Mechanisms: Continuous improvement of the recommendation system requires ongoing user engagement and feedback. Future research could focus on developing robust mechanisms for soliciting user feedback, analyzing user interactions, and iteratively refining recommendation algorithms to better meet the evolving needs and preferences of travelers.

REFERENCES

1. A Model for Intelligent Tourism Guide System
https://www.researchgate.net/publication/49965437_A_Model_for_Intelligent_Tourism_Guide_System
2. Location based Personalized Recommendation systems for the Tourists in India
https://www.researchgate.net/publication/330042945_Location_based_Personalized_Recommendation_systems_for_the_Tourists_in_India
3. A seven-year analysis of the tourism sector of India with a prediction model—A case study of smart tourism
https://www.researchgate.net/publication/380243823_A_seven-year_analysis_of_the_tourism_sector_of_India_with_a_prediction_model-A_case_study_of_smart_tourism
4. Vandecasteele, A.; Devillers, R. Improving Volunteered Geographic Information Quality Using a Tag Recommender System: The Case of OpenStreetMap. In *OpenStreetMap in GIScience: Experiences, Research, and Applications*; Jokar Arsanjani, J., Zipf, A., Mooney, P., Helbich, M., Eds.; Lecture Notes in Geoinformation and Cartography; Springer: Cham, Switzerland, 2015; pp. 59–80.
https://link.springer.com/chapter/10.1007/978-3-319-14280-7_4
5. Google Places. Available online
<https://developers.google.com/maps/documentation/places/web-service/overview>
6. OpenStreetMap Wiki. Downloading Data—OpenStreetMap Wiki. Available online
https://wiki.openstreetmap.org/wiki/Downloading_data
7. The Impact of Society on Volunteered Geographic Information: The Case of OpenStreetMap.
https://link.springer.com/chapter/10.1007/978-3-319-14280-7_7
8. Recommendation System Based on Tourist Attraction
<https://www.irjet.net/archives/V3/i4/IRJET-V3I4174.pdf>