Journal of Science and Technology
ISSN: 2456-5660 Volume 8, Issue 07 (July -2023)
www.jst.org.in *DOI:https://doi.org/10.46243/jst.2023.v8.i07.pp163- 168*

A Hybrid Framework For Travel Advice System Using Big Data And AI

Nusrath Zeeshan[1] | Dr.V.Bapuji[2]

[1]Department of MCA, Vaageswari College of Engineering,Karimnagar.
[2]Professor & HoD, Department of MCA, Vaageswari College of Engineering,Karimnagar.

To Cite this Article
Nusrath Zeeshan | Dr.V.Bapuji, "A Hybrid Framework For Travel Advice System Using Big Data And AI " *Journal of Science and Technology, Vol. 08, Issue 07,- July 2023, pp163-168*
Article Info
Received: 06-06-2023 Revised: 06-07-2023 Accepted: 17-07-2023 Published: 27-07-2023

ABSTRACT

In recent years, with the development of the internet and technology, the tourism industry has seen a significant increase in tourist numbers. The growing demand for personalized travel experiences has led to the development of travel advice systems for tourism. This helps travel agents find suitable travel destinations for clients, especially those unfamiliar with the location. Advisory systems are becoming more common in everyday activities like social networking and online buying. A hybrid framework for a travel advice system is proposed based on big data and artificial intelligence. The main aim of the system is to provide tourists with personalized travel planning based on user preferences and historical data. This allows the user to quickly locate what they are seeking for without wasting time or effort. It combines the strength of a content-based and collaborative filtering approach. To improve user affinity relationships and the quality of recommendations in the travel industry, a common recommendation filtering algorithm based on designations and user preferences has been proposed. Context-aware advice systems combine software computing and data mining to incorporate user profiles, social media history, and POI (points of interest) data. Suggestion system for a list of tourist attractions adapted to the preferences of tourists. Also acts as a travel planner by developing a detailed program that includes a multi-level framework for the travel advice system. Based on the traveler's experiences, the ratings (reviews) were also collected and analyzed to make better decisions for new travelers that advise tourist travel locations based on their previously rated venues. The algorithm searches the database for travel opportunities and uses text-mining techniques to find places of interest. the application of intelligent e-tourism consultation in tourism, focusing on interfaces, consultation algorithms, characteristics, and techniques of artificial intelligence. The goal aims to develop a hybrid travel advisory system that leverages intelligent e-tourism advice in the travel industry, focusing on interfaces and recommendations based on big data and artificial intelligence techniques.

KEYWORDS: Hybrid Advice system; Content-based Filtering; Collaborative Filtering; Context-aware system; e-Tourism; user preferences; trip planner.

1. INTRODUCTION

Tourism is a captivating domain. As it offers numerous destinations and attractions such as adventure, business, cultural/historical, etc. throughout the world for someone wishing to travel[1]. With such a large volume of options, travelers often need advice about where to go and what to see, Commonly, the tourist is helped by the travel agents who provide advice to tourists, but human factors like lack of memory and limited knowledge about the place can limit their ability to match their requirements against available options. However, the increasing number of choices and difficulties in locating services make it difficult for users to find what they are looking for[2], with the increasing demand for travel due to advancements in information and communication technology.

Factors such as availability of activities, affordability, popularity, and safety, influence a tourist's choice of vacation destination[3]. However, the efficiency of using the World Wide Web for finding a destination is questionable due to the lack of personalized information and can be complex and time-consuming for tourists. To address these issues, advice systems have been

developed to adapt to individual user profiles and contexts. Improving computer context access can improve human-computer interaction and result in more valuable computational services[4].

The advice systems are information filtering systems that give suggestions to clients about suitable offerings based on user preferences, and personal information to provide more accurate advice[5]. These systems forecast the level of interest in each item based on user navigation data. Traditional approaches include collaborative filtering, social advice systems, and contextual information.

However, the implementation of these systems, especially those using a hybrid approach, faces difficulties due to the variety of information sources and the heterogeneous nature of tourism data. This work aims to contribute to the design of tourism advice systems by proposing a framework that clarifies the hybrid advising process and details each step[6]. It is software that aids in the social process of indicating or receiving advice for a specific individual. In the tourism domain, advice may include places to visit, cities, attractions, heritage, events, travel plans, road maps, hotels, air companies, etc. The advice system can assist in matching customers' preferences and wishes against all available options and services, helping them to decide on their travel plan. And improve service quality[3][6].

To help tourists plan their journeys and to get information that they are looking for, travel advice systems, particularly in the tourism field, aim to match the characteristics of tourism and leisure resources with user needs. This study focuses on automated planners, opening and closing timings, and automatic grouping methods used in travel advice systems that include artificial intelligence (AI) approaches[7]. big data is being utilized to create enormous volumes of real-life data.

Tourism industry players may improve judgments, comprehend visitor behavior, and improve tourism experiences and services by properly using this data[8]. These systems can automatically learn user preferences through explicit or implicit feedback and can analyze the dynamic context of the trip, such as location, time, or weather. The suggested system improves user experience by making travel-related suggestions, especially for food, accommodation, and vacation destinations. This will enable the user to find what they are looking for easily, without spending time and effort[9,10].

2. EXISTING SYSTEM

The current tourism advisory system has different advisory approaches depending on how they analyze and filter user information.

2.1 Content-based filtering system:

This system is one of the most popular and widely used techniques in the tourism advisory system. This is the consulting approach based on the similarity of the elements. In the context of tourism, item specifics can include location, attraction type, rating, and price range. This strategy is widely used in tourism advisory systems as a content-based method of heritage advisory. The system selects resources based on user preferences and metadata, organizes objects based on multi-criteria feedback,[5], and improves suggestions based on semantic relationships.

However, content-based filtering requires a rich and generic representation of objects, which is not possible for large and diverse tourism items. Also, content-based systems often suffer from over-specialization, as a visitor may not want to return to the same place or event multiple times.

2.2 Collaborative filtering:

This is an advisory approach based on the behavior and preferences of similar users. Based on the habits and preferences of similar user profiles. In the tourism context, user behavior can include search queries, bookings, and ratings. Using the CF approach for counseling, after similar users have been found, the travel destinations are weighted according to their rating (rankings), and the travel destination with the highest weighting is recommended.The factorization matrix is used to generate a ranking[3], as some tourists may not have a ranking recorded[7]. The VISIT system analyzes news about attractions on Twitter and Facebook using sentiment analysis techniques to determine whether users post positive or negative comments[6]. This data is recorded in green and red on the system's user interface, allowing users to see which locations they prefer today and dislike. However, this strategy is more difficult to tailor to visitor needs, as it is nearly impossible to match user itineraries and experiences. It is also unusual to find two people on the same vacation with the same duration, interests, and experience.

2.3 Context filtering:

This technique is also referred to as a context-sensitive system[4]. Use context to predict what users will find interesting. Geographical locations, visit history, and weather are common contextual parameters in tourism advisory systems[2]. Connected devices such as mobile devices are now collecting and transmitting useful data. A context-sensitive advisory system that is designed and presented using a meta-model. The system is separated into three primary modules: connected spatial-temporal, context user profile and environmental information (location, device attributes, external physical environment), tourism content storage, and advisory system[2]. The deployment of the system in Tangier illustrates its power to predict and provide tourism services[6].

Impact of Existing System:

Using all these techniques alone has many disadvantages and does not constitute an effective system to advise tourists to reach their preferred destination. Based on similar user profile habits and tastes, collaborative filtering aims to offer visitors destinations that they might like. However, this approach is more difficult to meet the needs of tourists as it is difficult to balance travel history and user experience. Content-based advisory systems analyze content similarities between previously viewed and viewed articles. To predict what is likely to interest a user, context filtering uses context in its calculations. The contextual advisory system consists of three main modules: contextual information, time and environment coefficients, external physical environment, community information[2], an archive of tourism content, and an advisory system.

3. PROPOSED SYSTEM

The proposed architecture for tourist advice systems focuses on hybrid advice techniques to enhance user access to tourism resources in information retrieval systems like tourism portals and service providers Extra nets documentaries. A hybrid architecture for a recommendation system based on user context, and social affinity is proposed in research projects[10].

To overcome flaws and capitalize on strengths, this system blends content-based, social, and context-based techniques[5]. Another innovative aspect of this architecture is that the proposed system goes beyond the list of proposed attractions and can be thought of as a planning tool aimed at building a detailed program and complex for multi-day visits. As a result, customers will be provided with a diverse list of travel resources sites, activities, hotels, programs, etc) that precisely meet specific needs and preferences.

The system consists of five major modules(Fig. 1):

(a) Visitor Profiles reveal user preferences based on factors such as ratings and social information.

(b) Services Repository includes information on tourism services as well as multimedia assets.

(c) Contextual Meta-Model used to create suggestions, it takes into account elements such as time, place, location, and travel history.

(d) Hybrid Filtering gives a list of things with varying levels of user approval.

(e) Trip Planning chooses important elements and applies operational research approaches to link these selections in trip planning.

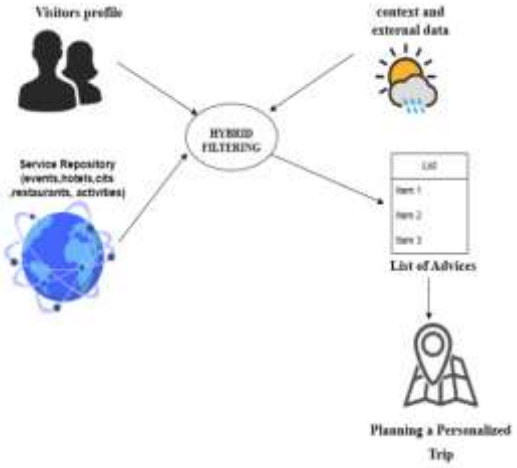

Fig.1 Architecture for hybrid advice system

3.1 proposed architectures framework

The proposed architecture's framework is made up of three key sub-processes: a process known as user profiling, a method for picking information (filtering) that best fits user profiles, and a trip planning process. These processes occur at the crossroads of several disciplines of computer science study, including artificial intelligence and operational research.

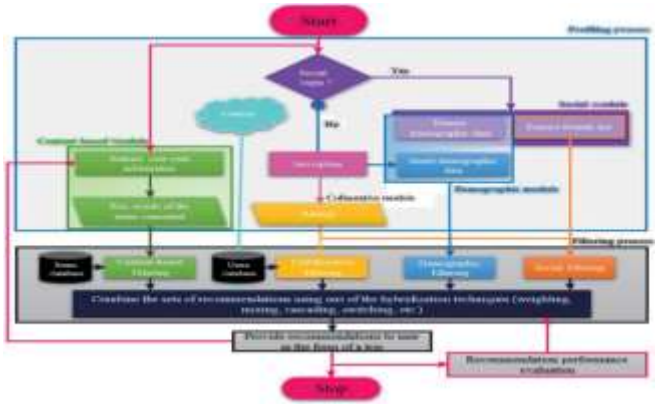

Fig.2 Flowchart of the proposed framework

3.2 user profiling process

The getting of user data is a critical phase in the proposed system, which involves four scenarios:

(a) Inscription. entails people declemographic information.

(b) Social login. Used to extract demographic data and user relationships from the system

(c) Consultation "even without a log-in". this is based on the observation and analysis of user behavior, such as manipulation and navigation signs.

(d) Context. is built on the integration of contextual information to create dynamic and personalized visit itineraries.

3.3 Filtering process

User profiling is used in the adaption of recommendation algorithms, which takes into

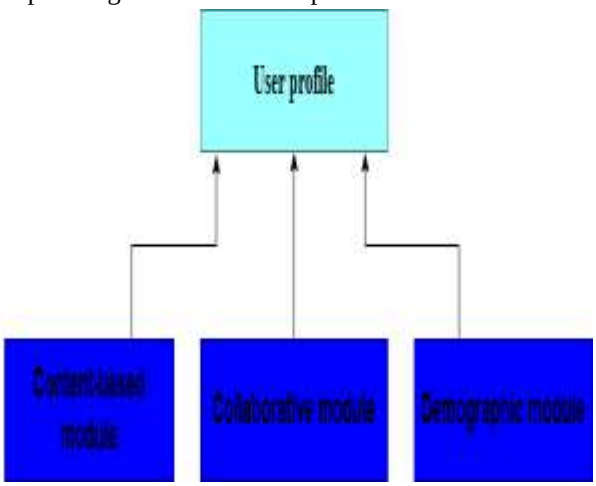

Fig.3 User profiling, represents that user profile contains only one of each module

consideration of the user's profile modules. These modules contain features that are content-based, collaboration/social, and demographic properties[10]. After recognizing these modules, recommendations are made using hybrid techniques such as weighting, mixing, cascading, switching, feature matching, feature enhancement, and leveling methods. by meta.

The process returns a list of items with the user's rating for each item[7].

3.4 Trip planning process

After evaluating the degrees, Taking these elements into account, the system selects the elements considered relevant for the user (e.g. reaching a specific limit).users context and uses operational research techniques to correlate these recommendations in the form of a trip.

4. BIG DATA AND AI INTEGRATION APPROACH FOR IMPLEMENTING THE PROPOSED ARCHITECTURE

The proposed hybrid travel advice system relies on big data to provide accurate and relevant advice, in the context of tourism, big data can include user profiles, search queries, bookings, ratings, and social media activity[8]. The proposed system leverages big data by using distributed computing frameworks such as Hadoop and Spark to process and analyze large volumes of data. This enables the system to identify patterns and trends that would be difficult to detect using traditional methods[6].

The proposed hybrid travel advice system relies on AI to provide intelligent and adaptive advice. In the context of tourism, AI can include machine learning, natural language processing, and computer vision. The proposed system leverages AI by using deep learning techniques to improve the accuracy and relevance of advice[9]. For example, the system can use image recognition algorithms to extract features from photos and videos of tourist attractions and incorporate them into the advice process.

Advantages of the proposed system: improve service quality and overcome the use of each single advice technique alone, and to take huge benefits of all techniques together, a hybrid travel advice system is used. The Proposed scheme calculates similarities between the target user and social space using a Hybrid Tourism advice System, offering fast, accurate, detailed, and individualized advice.

5. CONCLUSION

The proposed hybrid travel advice system for tourism based on big data and AI offers a promising approach to providing personalized tour advice to Tourists. By leveraging the strengths of content-based and collaborative filtering approaches, as well as big data and AI, the proposed system can provide accurate and relevant advice that enhances the travel experience.

Future work includes implementing and testing the proposed system on real-world data and evaluating its performance against existing advice systems in the tourism industry.

6. REFERENCES

[1] S. Loh, F. Lorenzi, R. Saldana, and D. Lichtnow, A ˜ tourism recommender system based on collaboration and text analysis, Information Technology & Tourism, vol. 6, no. 3, pp. 157–165, 2003.

[2] G. Fenza, E. Fischetti, D. Furno, and V. Loia, A hybrid context-aware system for tourist guidance based on collaborative filtering, in Proc. IEEE Int. Conf. Fuzzy Systems, Taipei, China, 2011, pp. 131–138.

[3] Sadeghi Elham, & Honarvar Alireza. (2021). A Tourism Recommender System using CF approach and Matrix Factorization. Zenodo. https://doi.org/10.5281/zenodo.5557889.

[4] Abowd, G.D., Dey, A.K., Brown, P.J., Davies, N., Smith, M., Steggles, P. (1999). Towards a Better Understanding of Context and Context-Awareness. In: Gellersen, HW. (eds) Handheld and Ubiquitous Computing. HUC 1999. Lecture Notes in Computer Science, vol 1707. Springer, Berlin, Heidelberg. https://doi.org/10.1007/3-540-48157-5_29.

[5] Alrasheed H., Alzeer A., Alhowimel A., Shameri N., Althyabi A. A Multi-Level Tourism Destination Recommender System (2020) Procedia Computer Science, 170, pp. 333-340.

[6] K. A. Fararni, F. Nafis, B. Aghoutane, A. Yahyaouy, J. Riffi and A. Sabri, "Hybrid recommender system for tourism based on big data and AI: A conceptual framework," in Big Data Mining and Analytics, vol. 4, no. 1, pp. 47-55, March 2021, doi: 10.26599/BDMA.2020.9020015.

[7] J. Borras, A. Moreno, and A. Valls, Intelligent tourism ` recommender systems: A survey, Expert Systems with Applications, vol. 41, no. 16, pp. 7370–7389, 2014.

[8] O. Boulaalam, B. Aghoutane, D. El Ouadghiri, A. Moumen, and M. L. C. Malinine, Proposal of a big data system based on the recommendation and profiling techniques for intelligent management of Moroccan tourism, Procedia Computer Science, vol. 134, pp. 346–351, 2018.

[9] K. H. Lim, J. Chan, C. Leckie, and S. Karunasekera, Personalized tour recommendation based on user interests and points of interest visit duration's, in Proc. 24th Int. Joint Conf. Artificial Intelligence, Buenos Aires, Argentina, 2015, pp. 1778–1784.

[10] A. Menk, L. Sebastian, and R. Ferreira, Recommendation systems for tourism based on social networks: A survey, arXiv preprint arXiv:1903.12099, 2019.