International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 04 | April - 2023 Impact Factor: 8.176 ISSN: 2582-3930

Hotel Recommendation System

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ABSTRACT :

A hotel recommendation system is a computer system that recommends hotels to a user based on their preferences. The system works by first gathering information about the user's preferences, such as the type of hotel they are looking for, the price range, and the location. The system then compares this information to a database of hotels to find the best matches. Finally, the system recommends a list of hotels to the user, ranked by how well they match the user's preferences.

INTRODUCTION

A hotel recommendation system is a software application that suggests hotels to users based on their preferences, past behavior, and other relevant factors. These systems are commonly used in online travel agencies, booking platforms, and other travel-related websites.

The primary goal of a hotel recommendation system is to improve user experience by providing personalized and relevant hotel suggestions that match the user's requirements. This can help users save time and effort in searching for suitable hotels and increase the chances of them making a booking.

The recommendation system uses a combination of data mining, machine learning, and natural language processing techniques to analyze user data such as search queries, location, date of travel, budget, and other preferences. The system then matches this data with information on hotels such as location, price, amenities, and user ratings to provide personalized recommendations.

There are different types of hotel recommendation systems, including content-based, collaborative filtering, and hybrid models. Content-based systems analyze user data and recommend hotels that have similar characteristics to those previously selected by the user. Collaborative filtering systems analyze user data and recommend hotels based on the behavior of similar users. Hybrid models combine the advantages of both approaches.

Overall, hotel recommendation systems can improve user experience, increase bookings, and enhance the reputation of travel-related websites.

RELATED WORK :

A huge quantity has already been done and written about item recommendation systems. A common method for those systems is to use a person-item matrix combining capabilities about the customers and gadgets together with person feedback for the gadgets. However, these methods proved to be inapplicable for our challenge, as the anonymized nature of the target variables made it tough to gain relevant features for them. extra applicable to our project, previous paintings has been performed on lodge recommendation systems with the aid of GAO Huming and LI Weili, who showed top consequences the use of a mixture of clustering and boosting algorithms. Even as their outcomes aren't similar to ours because of the large differences within the datasets used, it is great that each their paper and ours show promise in the usage of clustering and boosting for hotel recommendations..

OBJECTIVES

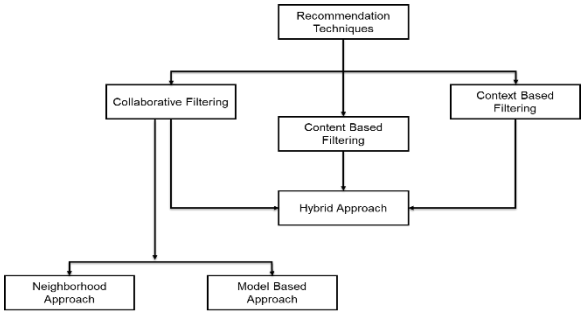
A hotel recommendation system's main goal is to offer consumers individualized and pertinent hotel options that cater to their unique requirements and interests. A hotel recommendation system may have the following specific goals:

1. Improve the user experience: The system seeks to give users a more personalized and effective approach to discover hotels, which can enhance the experience for all users.
2. Boost customer satisfaction: The system may foster a sense of loyalty among customers by making hotel recommendations that are tailored to their tastes.
3. Increased hotel occupancy rates may be achieved by providing users with pertinent hotel ideas, which will ultimately result in increased reservations for the hotels.
4. Reduce customer turnover: The system can assist in reducing customer churn by enhancing the customer experience and satisfaction.

A hotel recommendation system's primary goal is to offer consumers tailored, useful, and effective hotel recommendations that improve their travel experience overall and increase reservations for hotels and booking platforms.

LITERATURE REVIEW :

Due to the expansion of internet trip booking sites, hotel recommendation systems have grown in popularity in recent years. These systems recommend hotels to clients based on their tastes and requirements using data analytics, machine learning, and natural language processing techniques. We will examine the various methods and procedures employed in hotel suggestion systems in this literature analysis**.**



Collaborative filtering is a common technique used in lodging suggestion systems. A method called

collaborative screening suggests products to a user based on the products that comparable users like. Collaborative filtering is a technique used in hotel suggestion systems that suggests hotels to users based on the hotels that other users who share their tastes have chosen. Zheng et al. (2017) used joint filtering in one of their studies to create a method for lodging recommendations. In order to forecast the ranking a user would assign a specific hotel, the system used the ratings provided by users to hotels.

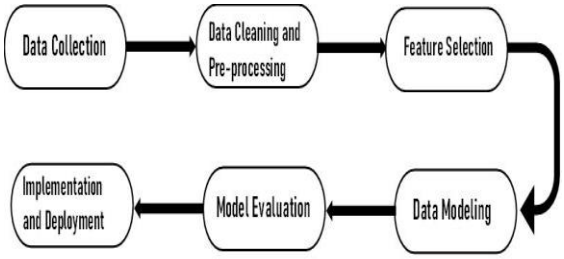
Content-based filtering is another strategy applied in lodging suggestion systems. A person is given lodging recommendations based on the properties' characteristics and features through content-based filtering. According to a user's tastes for particular facilities like a pool, gym, or complimentary breakfast, a content-based recommendation system might suggest a hotel to them. In one research, user-generated evaluations were integrated into a content-based recommendation system by Liu et al. (2019) to increase the system's accuracy.

Hotel recommendation systems have also used hybrid recommendation systems, which incorporate joint filtering and content-based filtering. Because they can incorporate various kinds of data, hybrid systems can make suggestions that are more precise than those made by individual systems. For instance, a hybrid system might suggest a motel based on the user's tastes and the reviews of other users who share those preferences.

Deep learning algorithms have been applied in hotel suggestion systems recently. Large-scale data analysis and the extraction of characteristics that are challenging to find using conventional machine learning methods are capabilities of deep learning models. In one research, Zheng et al. (2020) developed a hotel recommendation system using a deep learning model that included both user-generated evaluations and hotel images.

In conclusion, lodging suggestion tools are a crucial component of online travel agency websites. The various methods and strategies incorporated into these platforms include collaborative filtering, content-based filtering, hybrid systems, and deep learning models.

PROPOSED METHODOLOGY :



Data Collection: The first step in the hotel recommendation system is to collect data from various sources such as hotel websites, travel websites, social media, and other relevant platforms. The data collected should include information on hotel location, amenities, ratings, reviews, and prices.

Data Cleaning and Pre-processing: The next step is to clean and pre-process the data collected. This involves removing duplicate entries, handling missing values, and transforming the data into a suitable format for analysis.

Feature Selection: In this step, relevant features are selected from the pre-processed data that are essential for hotel recommendation. The features selected could be amenities, location, ratings, reviews, and price.

Data Modeling: The data modeling step involves applying machine learning algorithms such as collaborative filtering, content-based filtering, or hybrid filtering to the pre-processed data. These algorithms learn from the data to predict the user's preferences and recommend hotels that match the user's requirements.

Model Evaluation: The performance of the recommendation model is evaluated using appropriate evaluation metrics such as precision, recall, F1-score, and accuracy. The model is trained and tested using historical data, and the evaluation is done based on the test results.

Implementation and Deployment: Once the model is evaluated and optimized, it is ready for implementation and deployment. The hotel recommendation system is integrated into the booking platform or hotel website to provide users with personalized and relevant hotel suggestions.

Proposed Approach for Hotel Recommendation System:

The proposed approach for hotel recommendation system is a hybrid filtering technique that combines content-based and collaborative filtering. In this approach, the system analyzes the user's past behavior, such as booking history, ratings, and reviews, to identify their preferences. The system also considers other users with similar preferences to recommend hotels that match the user's requirements. The steps involved in the proposed approach are:

User Profiling: The system creates a user profile by analyzing the user's past behavior, such as booking history, ratings, and reviews. The user's preferences are identified based on the hotels they have booked, the ratings they have given, and the reviews they have written.

Hotel Profiling: The system analyzes the hotels' data, such as location, amenities, ratings, and reviews, to create a hotel profile.

Content-Based Filtering: The system recommends hotels that match the user's preferences by using content-based filtering. The system analyzes the hotel profile and user profile to find hotels that match the user's preferences.

Collaborative Filtering: The system recommends hotels based on the preferences of other users with similar preferences. The system finds users with similar preferences to the current user and recommends hotels that these users have liked.

Hybrid Filtering: The system combines the content-based and collaborative filtering to recommend hotels that match the user's preferences based on their past behavior and the preferences of similar users.

System Evaluation: The system is evaluated using appropriate evaluation metrics such as precision, recall, F1-score, and accuracy. The system is trained and tested using historical data, and the evaluation is done based on the test results.

Implementation and Deployment: Once the model is evaluated and optimized, it is ready for implementation and deployment. The hotel recommendation system is integrated into the booking platform or hotel website to provide users with personalized and relevant hotel suggestions.

FUTURE SCOPE :

The future scope for hotel recommendation systems is vast and promising, with new technologies and advancements in AI and machine learning. Some potential areas of development include:

Personalization: Personalization is the key to providing a unique and satisfactory experience to each user. In the future, hotel recommendation systems will be able to tailor their suggestions to each individual user's preferences and needs based on their past behavior and feedback.

Voice recognition: With the growing popularity of voice-enabled devices, hotel recommendation systems may soon be able to respond to voice commands and provide personalized recommendations in real-time.

Augmented reality: With the help of AR technology, hotel recommendation systems can provide users with a virtual tour of the hotel, its rooms, amenities, and services, enabling them to make more informed decisions.

Integration with social media: Integration with social media platforms can allow hotel recommendation systems to gather more information about users, including their interests, preferences, and travel history, which can be used to improve the recommendations provided.

Sustainability: The future of hotel recommendation systems may also include sustainability as a key factor in their recommendations, providing users with eco-friendly and sustainable options.

Overall, hotel recommendation systems have enormous potential in providing travelers with personalized and informed recommendations, and we can expect to see many exciting developments in this field in the coming years.

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