



EventPilot AI: A Review of Smart Event Booking and Recommendation Platform

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ABSTRACT :

When organizing an event, people must look for and evaluate a variety of service providers, including photographers, DJs, musicians, makeup artists, event hosts, and locations. Factors such as budget, location, ratings, style, availability, and event type make this procedure time-consuming. Content-based, collaborative, hybrid, context-aware, and explainable recommendation strategies can enhance personalization and reduce information overload, according to current recommender-system research. In addition to cold-start handling, review-based recommendation, and conversational interfaces, this evaluation looks at these methods and connects them to EventPilot AI. To produce relevant service recommendations, the suggested platform integrates user needs including event type, budget, location, date, and service category. With the help of an AI-powered conversational assistant, it also offers understandable elements like ratings, availability, style resemblance, and budget fit. A practical gap in combining multi-factor matching, availability-aware booking, explainable recommendations, and conversational support into a single event-planning platform is found in the review. With its application-oriented smart event scheduling and recommendation platform, EventPilot AI fills this gap.

Keywords: Explainable AI, Service Provider Matching, Conversational AI, Hybrid Recommendation, Context-Aware Recommendation, Event Booking, and Recommender Systems

Introduction

For events like weddings, birthdays, and business gatherings, users may require many services, making event planning a multi-constraint decision-making effort. Comparing essentials like cost, location, ratings, style, availability, and event needs is necessary to find skilled photographers, DJs, makeup artists, musicians, event hosts, and other service providers. Users spend a lot of time looking, comparing, and confirming possibilities when this information is completed various platforms and individual postings.

By using strategies like content-based filtering, collaborative filtering, and hybrid recommendation, recommender systems can reduce this information overload. By taking into account variables like time, location, and user needs, context-aware recommender systems enhance personalization even more. Additionally, explainable recommendations are crucial since customers might need to understand the validation behind a service's advice.

Context and availability play a major role in event services. For instance, a highly viewed photographer would not be appropriate if they are unavailable on the necessary date, while an inexpensive service could

not be possible due to its location. Therefore, popularity-based ranking alone is insufficient for effective event-service recommendation.

EventPilot AI is a platform for intelligent event booking and recommendation that combines booking, personalized matching, and service discovery into a single process. In order to produce targeted recommendations for categories like photographers, DJs, makeup artists, musicians, and event hosts, it takes into account the needs of the event as well as the characteristics of the service provider. Reducing manual comparison while maintaining user participation in the ultimate decision-making process is the aim.

Problem Statement

Event-service discovery presents a number of difficulties since consumers must take into account several factors at once in order to choose appropriate service providers. Users may need photographers, DJs, musicians, makeup artists, event hosts, locations, and other services for events including weddings, birthdays, business gatherings, and social gatherings. The existing event-service discovery procedure is frequently related to the following issues:

1.1. Information Overload: Through search engines, social media pages, listing platforms, and personal recommendations, users may come across a lot of service providers. However, consumers may not always be able to find the best solutions with a vast variety of results. Price, location, ratings, availability, service quality, and suitability for their particular event requirements are still elements that users must carefully verify.

1.2. Disjointed Decision Making: Rather than using a single system, event services are frequently found through various platforms and sources. On one site, users might look for a photographer; on another, they might look for a DJ; on social media or through personal connections, they might look for a

cosmetic artist. This disjointed procedure increases the time and effort needed for event preparation and makes it challenging to evaluate service providers consistently.

1.3. Limited Personalization: Keywords, categories, and simple filters are the main components of many traditional listing and search systems. Multiple user preferences, including event kind, budget, location, preferred style, ratings, and service needs, might not be successfully combined by them. As a result, rather than recommendations that are personalized to their needs, users can obtain a general list of services.

1.4. Availability and Context Constraints: Contextual elements such as the event date, location, occasion type, budget, and schedule have a significant impact on whether an event service is appropriate. If a highly viewed service is not available on the necessary date or does not serve the event site, it might not be helpful. In a similar manner, a service that is affordable might not fulfil the user's desired aesthetic or event specifications. Therefore, rather than depending only on popularity or ratings, suggestions must take into account a variety of limits.

1.5. Limited Recommendation Explanation: Current ranking or recommendation systems may produce results without providing a clear explanation for the recommendation of a specific service. To assess suggestions and make wise choices, users might want clear information. A recommendation's relevance can be better understood by consumers and the decision-making process made more transparent by taking into account factors including budget fit, style resemblance, geographic suitability, ratings, and date availability.

These difficulties point to the necessity for an integrated strategy that can merge user preferences, contextual limitations, service-provider data, and recommendation methods into a unified event-planning workflow. By offering tailored service recommendations along with related matching characteristics and assisting with the booking process on a single platform, EventPilot AI seeks to address these issues.

Literature Survey

1.6. Hybrid and Classical Recommender Systems

Traditionally, content-based, collaborative, and hybrid techniques have been the focus of recommender-system research. While collaborative filtering learns from interactions or preferences of users with similar behavior, content-based systems identify appropriate options based on item properties and user preferences. To get beyond the drawbacks of depending just on one information source, hybrid systems incorporate many recommendation strategies. Personalized recommendation systems are built on these methods.

A service provider's attributes, including category, price range, location, style, ratings, portfolio characteristics, and availability, can be described using content information for EventPilot AI. Bookings, ratings, saved services, and user interaction history can all be used to generate collaborative signals later on. Because service-provider attributes may be available from the start and a new platform may have little interaction data at first, a hybrid architecture makes sense.

1.7. Recommendation Based on Context

Context-aware recommender systems modify their suggestions based on the circumstances around the request. Time, place, user needs, and other circumstances that affect an option's acceptability can all be considered context. The event kind, date, location, budget, guest count, preferred style, and service category are all important contextual details for event planning. These elements may have a direct impact on the suitability of a certain service. Therefore, rather than just rating providers based on popularity, EventPilot AI approaches recommendation as a contextual matching problem. When just one photographer is available on the desired day, for instance, two photographers with comparable ratings can be given different referral priorities. In a similar vein, a service that is affordable but does not operate close to the event site might not be a useful suggestion.

1.8. The Cold-Start Issue and Collaborative Filtering

When there is enough user-service interaction data, collaborative filtering can offer tailored recommendations. However, the cold-start issue and data sparsity are frequent problems in recommender systems. While a newly registered service provider might have little interaction history, a new user might not have any prior ratings or reservations.

By utilizing requirement-based and content-based matching in the early stages, EventPilot AI can lessen this restriction. Without requiring a lengthy history of prior reservations, a new user can receive recommendations after inputting details like event type, budget, location, date, service category, and preferences. Interaction history can be added to a hybrid recommendation layer to enhance personalization as platform usage rises.

1.9. Explainable Recommendation

A recommendation is more valuable to users who can understand the basis by which it was formulated. Explainable recommendation addresses this issue by providing explanations for recommendations made by the system and improving recommendation transparency. This feature is important in event planning because users often need to evaluate several service providers before selecting a preferred option.

EventPilot AI uses this customer support strategy by providing human-readable matching factors. Instead of displaying a score indicating the degree of match between user's requirements and a specific service provider, the system uses tags to highlight factors used to select a specific option. Tags such as 'within budget', 'available on selected date', 'highly rated', 'preferred style', and 'nearby location' enable users to identify the factors considered during selection and ensure that recommendations meet their criteria.

1.10. Reviews and User Feedback

Besides the scores provided by the reviews, the text of individual feedback provides additional information concerning the quality of services offered by a specific service provider. Most clients prefer to read reviews to obtain more details about their intended service, including punctuality, professionalism, and courtesy of employees. Information contained in reviews helps users to make informed decisions when choosing a service provider, particularly when the event is of utmost importance.

EventPilot AI can take into consideration the information derived from reviews, in addition to the criteria of structured ratings and service provider attributes. However, the information should be treated with caution due to potential issues of incompleteness, subjectivity, and bias. Thus, the review information should be used for supporting the recommendation process, but not determine the final recommendation result independently.

1.11. Conversational and Explainable Recommendation

The conversational interface offers another avenue for capturing the user requirements. Instead of asking the user to define the requirements using multiple filters, the system can utilize a conversation to narrow the search results. The conversation can include questions about the event type, budget, area, date, specific service, and other criteria.

The recommendation system of EventPilot AI can employ a chatbot as a conversation interface for asking the clarifying questions about the user's requirements. In turn, the recommendation engine can process the requirements and match them against the available services to find the best fit. The separation of concerns allows the chatbot to help the user to define their requirements and service specifications without presenting the conversation as the final selection criterion.

1.12. Summary of Findings and Positioning of EventPilot AI

The literature reviewed in this paper highlights the fact that there is no one method that can be utilized in all cases to recommend events to users. In particular, the content-based method is optimal when the characteristics of service providers are known, while collaborative filtering is more efficient when the interaction data of users with events are available. Hybrid methods, in turn, allow using multiple sources of information, while context-aware methods are optimized for incorporating the specifics of dates, locations, and budgets. Explainable recommendations focus on providing users with justifications for their recommendations, while cold-start issues are common when users or service providers are new to the system. Therefore, EventPilot AI should be positioned as a tool that integrates some of these approaches in a specific context.

In particular, the practice of event planning is associated with searching for events, comparing them, getting recommendations tailored to their requirements, and making bookings, which is why the findings are linked to the proposed solution by the author. Thus, the key objective of this work is to integrate existing methods and utilize them in a particular setting, rather than optimize a specific algorithm.

Proposed Methodology

1.13. Review and System Design Methodology

The proposed methodology is based on the research in recommender-system techniques, contextual personalization, hybrid recommendation, cold-start handling, explainable recommendation, review-based recommendation, and conversational assistance. These concepts were matched to the requirements of the event-service booking platform. The proposed system uses a modular architecture, in which the user interaction, service-provider data, recommendation, conversational assistance, and booking modules are separated. It ensures that every component has a specific set of functions but remains integrated to manage the complete event-planning process.

1.14. Data Collection

The event service marketplace will involve two types of data: user or event requirements and service-provider information. The former includes such information as event type, date, location, budget, preferred category, style preferences, and others. The latter entails service category, location, price range, availability, ratings, reviews, portfolio, style tags, description, and booking status. Initially, the prototype can use sample or test provider data, which will be later replaced by the validated data.

1.15. Data Preprocessing and Feature Engineering

The collected data is prepared before being used by the recommendation component. The preprocessing step could consist of removing missing values, standardizing category labels, removing duplicates, validating dates, normalizing numbers, and other processes. Qualitative attributes can also be converted into structured features to be used by the recommendation.

The feature set could consist of budget compatibility, location suitability, date availability, event-type compatibility, service-category match, rating, style similarity, and interaction information. For instance, price information could be used to find if the provider fits the user's budget, while the location information could be used to find geographical suitability. These features could be used to recommend the service while maintaining the major matching factors understandable to the user.

1.16. Recommendation Engine

The first version of the recommendation engine could utilize a weighted hybrid and context-aware scoring algorithm. The matching mechanism will include the criteria budget compatibility, location, availability, event type, category, rating, style similarity, and user preferences. The value of each criterion can be prioritized depending on the user's request and will affect the recommendation score rather than using a one-size-fits-all method.

The system will provide a shortlisted of the most relevant service providers instead of overwhelming the user with all available services. Each recommendation will include the most relevant compatibility criteria, such as 'Within budget,' 'Available,' 'High rating,' or 'Matches preferred style.' Furthermore, after collecting sufficient data about user preferences, the system can implement collaborative filtering and other methods to individualize the recommendations.

1.17. Conversational AI Layer

The chatbot layer will be responsible for gathering requirements and offering assistance. It can be utilized to describe the user's event requirements, identify gaps, summarize selected preferences, and recommend corresponding service categories. The recommendation component could be used to perform the actual matching operation based on the collected user preferences. Through this interaction, the chatbot will be able to support the user in their selection process while having a separate recommendation component that manages the recommendation process in a structured manner.

1.18. Booking Workflow

After reviewing the recommended options, users will be able to view the provider's details and make a booking. The component's process will involve choosing the desired service and date, submitting booking requests, reviewing availability, and storing the requested details. It is crucial to ensure availability prior to making a booking confirmation to avoid double-booking. User dashboards will be utilized for managing the requests, while the providers will be able to update their details and availability using the provider's interface. The administrative panel will be used for reviewing and approving bookings, as well as managing the operations of the platform.

Research Gap

The major research gap identified from the reviewed literature is the limited integration of prediction, human-stress attribution, explainability, risk assessment, and policy simulation within a single groundwater decision-support platform, summarised below.

Table 1. Research gap and positioning of EventPilot AI

No.	Identified Research Gap	Existing Research	Eventpilot
1	Limited integration of event services	Current solutions mostly essence on specific event-management tasks or event discovery.	Combines several event services into a single platform, including makeup artists, DJs, photographers, musicians, and event presenters.
2	Limited personalization of recommendations	Many systems make recommendations primarily based on user history or event attributes and employ simple content-based or collaborative filtering.	Uses personalized AI-based recommendations based on user preferences, past interactions, location, needs, and service attributes.
3	Lack of budget-aware recommendations	Current methods for recommending events typically focus more on user preferences and Relevance than on complete budget	Helps users choose appropriate services within their budget by offering budget estimation and budget-aware service

No.	Identified Research Gap	Existing Research	Eventpilot
		preparation.	recommendations.
4	Limited intelligent search	Traditional platforms mostly rely on predefined categories, filters, and keyword-based search.	Uses AI-powered semantic search to better understand customer needs and locate suitable event services.
5	Limited conversational assistance	Fixed choices and search interfaces are typically offered by traditional event platforms; nevertheless, current conversational recommender research continues to highlight practical problems such response quality, latency, and cost	Incorporates an AI chatbot that uses natural language interaction to help users with event planning, finding services, recommendations, and simple questions.

Result Analysis / Expected Outcomes

Since EventPilot AI is an application-focused project, its assessment should consider both the quality of recommendations and how easy it is to use in real-world situations.

The recommendation method can be tested by comparing it with a simpler approach that uses just keywords or filters. Evaluation measures may include Precision@K, Recall@K, NDCG@K, coverage, diversity, and response time. User-focused metrics such as how relevant the recommendations feel, how easy it is to compare options, and overall satisfaction can also be taken into account. Recommendation quality can also be evaluated by checking whether users can understand why particular service providers are suggested. EventPilot AI is expected to provide a relevant list of service providers according to user's event requirements.

For example, if a user mentions a wedding, preferred location, budget, and photography style, the system should highlight providers that meet these criteria and explain the main reasons for their selection. A provider with a high rating but who is not available on the requested date should not be automatically placed higher than an available provider that better fits all the requirements.

The prototype is expected to include features such as user registration, access control based on user roles for both customers and service providers, finding service providers, tailored suggestions and complete service-provider details, booking support, dashboards, and chat-based assistance.

The recommendation interface can show clear indicators like “Within budget,” “Available,” “High rating,” and “Style match.” These elements reflect the intended system and interface outcomes, not performance metrics. Numerical results should only be shared after the system has been tested with a specific dataset and evaluation process.

One of the main expected benefits is the reduction of the time and effort needed for manual searching and comparing service providers.

Instead of reviewing many profiles one by one, users can simply share their event details and get a more manageable list of suitable options. For service providers, the platform can enhance visibility by linking their services to users whose event needs match their category, location, pricing, preferences, and availability.

Conclusion and Future Scope

EventPilot AI offers an intelligent solution for event planning by integrating service discovery, user-specific suggestions, clear matching reasons, and booking all within a single platform. The system takes into account various factors including budget, location, event type, date, ratings, and user preferences to suggest appropriate service providers. However, the current system may encounter challenges such as limited data, cold-start issues, subjective reviews, and outdated availability information.

Future improvements can involve techniques like collaborative filtering, learning-to-rank, analysis of review text, image-based style matching, and location-aware recommendations. The system could also be expanded to recommend multiple compatible services together and offer more effective conversational support. In summary, EventPilot AI aims to simplify the process of finding suitable event services and assist users in making well-informed decisions. Additional testing with real users and real-world data will be necessary to assess its accuracy, usability, and overall performance.

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