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EventVerse: A Smart Web-Based Event Planning and Vendor Recommendation System Using Supabase and React

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***Abstract*-Event management has evolved significantly with the rise of digital platforms, yet many existing systems lack personalisation, transparency, and efficient coordination. This paper presents EventVerse, an intelligent event planning and organization platform designed to simplify event management through automation and modern web technologies. The system enables users to discover, compare, and book event-related services, such as venues, photographers, and decorators, through a unified interface.**

Unlike traditional systems, EventVerse integrates user preferences, location data, and interaction history to provide personalized recommendations. The platform also ensures transparency through verified vendor profiles, real-time updates, and secure booking mechanisms powered by modern backend services. The proposed solution addresses limitations such as scattered information, unreliable reviews, and inefficient communication. Experimental implementation demonstrates improved user engagement, reduced planning time, and enhanced decisionmaking efficiency.

I .Introduction

Event planning traditionally involves multiple manual processes such as vendor coordination, scheduling, and budget management, making it time-consuming and inefficient. Existing solutions often rely on fragmented sources like social media or individual vendor websites, leading to poor user experience and lack of trust.

Modern systems leverage intelligent techniques to improve recommendations and usability. As highlighted in , incorporating user preferences and contextual factors significantly improves event discovery.

EventVerse is designed to:

- Provide a centralized event planning platform
- Deliver personalized vendor recommendations
- Ensure transparency through verified vendors
- Simplify booking and communication

This system enhances both efficiency and reliability in event planning.

Event management has witnessed rapid digital transformation due to the increasing adoption of webbased platforms and cloud technologies. However, most existing systems still operate in fragmented environments where users must rely on multiple sources to gather information about vendors, pricing, and availability. This leads to inefficiencies, increased planning time, and lack of trust in decision-making.

With the advancement of intelligent recommendation systems and real-time data processing, there is a growing need for integrated platforms that provide personalized and reliable event planning solutions. EventVerse aims to bridge this gap by combining modern web technologies with user-centric design principles to deliver a seamless planning experience.

The system not only simplifies vendor discovery but also enhances transparency and trust by incorporating verified vendor profiles and dynamic user feedback mechanisms. This research focuses on designing and implementing a scalable architecture that improves efficiency and user satisfaction in event planning.

Event management has become an essential component of both personal and professional activities, encompassing a wide range of events such as weddings, corporate gatherings, conferences, and social celebrations. With the increasing complexity and scale of modern events, the demand for efficient planning solutions has grown significantly. Traditional event planning methods rely heavily on manual coordination, personal networks, and fragmented online resources, making the process time-consuming, inefficient, and often unreliable.

In recent years, digital transformation has introduced web-based platforms that attempt to simplify event planning. However, many existing systems fail to provide a comprehensive solution due to limitations such as lack of personalization, inconsistent vendor information, and absence of real-time updates. Users are often required to switch between multiple platforms to gather details about venues, photographers, decorators, and other service providers. This fragmented approach not only increases planning effort but also reduces user confidence in decision-making.

The rapid advancement of modern web technologies and cloud-based services has opened new possibilities for developing intelligent and scalable systems. Technologies such as React enable the creation of dynamic and responsive user interfaces, while backend platforms like Supabase provide real-time data management, authentication, and seamless API integration. These advancements allow developers to build applications that are not only efficient but also capable of delivering personalized user experiences.

A key aspect of improving event planning systems lies in the integration of recommendation mechanisms. By analyzing user preferences, location, budget constraints, and interaction history, intelligent systems can provide tailored suggestions that significantly reduce the effort required for vendor selection. Personalization enhances user satisfaction by presenting relevant options, thereby improving overall decision-making efficiency.

EventVerse is proposed as a smart web-based event planning and vendor recommendation system that addresses the shortcomings of existing solutions. The platform provides a centralized environment where users can discover, compare, and book event-related services through a unified interface. It incorporates verified vendor profiles, real-time updates, and intelligent filtering mechanisms to ensure transparency and reliability.
Furthermore, the system is designed with scalability and usability in mind. By leveraging cloud-based architecture and modular design principles, EventVerse can efficiently handle growing user demands while maintaining performance. The user-centric interface simplifies navigation and interaction, making the platform accessible to individuals with varying levels of technical expertise.

This research focuses on the design, implementation, and evaluation of the EventVerse system. The proposed solution aims to enhance event planning by reducing complexity, improving efficiency, and delivering a seamless user experience. The results demonstrate that integrating modern technologies with intelligent recommendation techniques can significantly transform traditional event management processes.

II. Literature Review”

1. Various studies have explored the use of recommendation systems in event planning and service discovery platforms. EventRec: Personalized Event Recommendations proposed a personalized event recommendation model using user preferences and contextual data, demonstrating improved relevance in event suggestions.

2. Similarly, Event Planning and Organizing Portal focused on developing centralized platforms for managing event-related activities, highlighting the importance of integrating vendor services into a single interface. However, these systems lacked real-time interaction and advanced filtering mechanisms.

3. Modern cloud-based solutions such as Supabase and React have enabled the development of scalable and responsive applications. Despite these advancements, there remains a gap in combining personalization, transparency, and real-time updates in a unified system.

4. This paper builds upon existing research by integrating intelligent filtering, cloud backend services, and user interaction data to create a comprehensive event planning platform.

III. Dataset

The system uses structured and dynamic datasets including:
Dataset Components:

- **User Data**: Preferences, location, booking history
- **Vendor Data**: Services, pricing, ratings, availability
- **Event Data**: Type, schedule, location
- **Interaction Data**: Searches, clicks, bookings

The dataset supports personalization and recommendation, similar to event-based systems discussed in .

Data Source:

- User-generated data
- Vendor input
- System logs (real-time interactions)

Dataset Type	Attributes Included	Purpose
User Data	Preferences, Location, Booking History	Personalization
Vendor Data	Services, Price, Ratings, Availability	Vendor recommendation
Event Data	Event Type, Date, Location	Event planning
Interaction Data	Clicks, Searches, Bookings	Recommendation improvement

III-A Problem Statement

Event planning in traditional environments involves multiple disconnected processes such as vendor identification, communication, scheduling, and budget management. These processes are often carried out manually or through unstructured digital platforms, resulting in inefficiencies and increased cognitive load on users.

One of the major challenges is the lack of a centralized system that integrates all eventrelated services. Users frequently depend on social media platforms, personal references, or individual vendor websites, which may provide incomplete or unreliable information. This leads to poor decision-making and increased risk in vendor selection.

Additionally, existing systems rarely provide personalized recommendations based on user preferences, location, and past interactions. The absence of intelligent filtering mechanisms further complicates the selection process, especially when multiple vendors offer similar services.

Therefore, there is a need for a unified, intelligent platform that simplifies event planning, improves transparency, and enhances user experience through automation and personalization

III-B Objectives

The primary objectives of this research are:

- To design a centralized web-based platform for event planning
- To implement a recommendation mechanism based on user preferences and interaction data
- To ensure transparency through verified vendor information
- To enable real-time communication and booking functionalities
- To develop a scalable and efficient system using modern web technologies

III-C Dataset Description (Expanded)

The dataset used in the EventVerse system is a combination of structured and semi-structured data

collected from multiple sources. It plays a crucial role in enabling personalization and improving system performance.

User data includes demographic details, location, preferences, and historical booking information. This data is used to understand user behavior and tailor recommendations accordingly. Vendor data consists of service descriptions, pricing details, ratings, reviews, and availability schedules.

Event-related data includes event types such as weddings, corporate events, and private parties, along with associated requirements and timelines. Interaction data captures user activities such as searches, clicks, and bookings, which are used to refine recommendation algorithms over time.
The dataset is continuously updated through real-time interactions, ensuring that the system remains dynamic and responsive to user needs.

IV. Implementation

The EventVerse system is implemented using **modern web technologies and cloud-based backend services** to ensure scalability, responsiveness, and real-time performance.

a. **Frontend Development** o Built using **HTML, CSS, and JavaScript** o React.js framework used for dynamic and component-based UI
   i. Responsive design ensures compatibility across devices
b. **Backend & Database Integration** o **Supabase** is used as the backend service
   i. Provides:
      1. Real-time database (PostgreSQL)
      2. Authentic at ion system
      3. API integration o Handles user data, vendor listings, and bookings
c. **System Integration** o React frontend communicates with Supabase APIs o Data is fetched and updated in real time
   i. Authentication ensures secure access
d. **Recommendation Mechanism**
   i. Filters vendors based on: ▪ User preferences
      1. Budget
      2. Location
      3. Ratings o Displays ranked results dynamically
e. **Testing & Deployment** o Functional testing for UI and database o Performance testing for responsiveness o Deployment on web platform

This implementation ensures a **lightweight, scalable, and real-time system architecture**.

Layer	Technology Used	Purpose
Frontend	HTML, CSS, JavaScript	UI Design
Framework	React.js	Dynamic UI
Backend	Supabase	Backend-as-aService
Database	PostgreSQL	Data Storage
APIs	REST APIs	Communication

The implementation of EventVerse follows a modular and scalable approach, ensuring maintainability and extensibility. Each component of the system is designed to handle specific functionalities, enabling efficient interaction between frontend and backend layers.

The frontend is responsible for rendering dynamic user interfaces and handling user interactions such as search queries, booking requests, and profile management. The backend processes these requests, performs authentication, and retrieves relevant data from the database. Real-time synchronization ensures that users receive up-to-date information regarding vendor availability and booking status.

Additionally, the system incorporates error handling and validation mechanisms to ensure data integrity and

prevent unauthorized access. This architecture enhances system reliability and performance.

V. Technologies Used

Frontend:

- HTML
- CSS
- JavaScript
- React.js (Framework)

Backend & Database:

- **Supabase (Backend-as-a-Service)** o PostgreSQL Database o Authentication o RESTful APIs

Additional Tools:

- API integration
- Cloud-based services
- Responsive design techniques

These technologies provide a modern, scalable, and efficient system compared to traditional architectures .

VI. Proposed System

The proposed system offers:

- Centralized event vendor platform
- Verified vendor profiles with pricing and reviews
- Smart filtering (budget, location, event type)
- Secure booking and communication system
- User dashboard and tracking

As described in your project , this system solves:

- Lack of transparency
- Scattered vendor information
- Inefficient planning process

IV-A Advantages of the Proposed System

The proposed EventVerse system offers several advantages over traditional event planning methods:

- Improved efficiency through automation of vendor discovery and booking processes
- Enhanced user experience with a responsive and interactive interface
- Increased transparency via verified vendor profiles and real-time updates
- Scalability enabled by cloud-based backend infrastructure
- Personalized recommendations based on user preferences and interaction history

These advantages contribute to a more streamlined and user-friendly event planning experience.

V-B Limitations

Despite its benefits, the system has certain limitations:

- Dependence on internet connectivity for realtime functionality
- Limited dataset in initial stages may affect recommendation accuracy
- Vendor verification requires manual validation in early deployment phases
- Scalability challenges may arise with extremely large user bases

Future improvements can address these limitations through advanced machine learning techniques and optimized database management.

IV-C Recommendation Algorithm

The recommendation mechanism in EventVerse is based on a multi-criteria filtering and ranking approach. The system processes user inputs and applies a series of filters to generate relevant vendor suggestions.

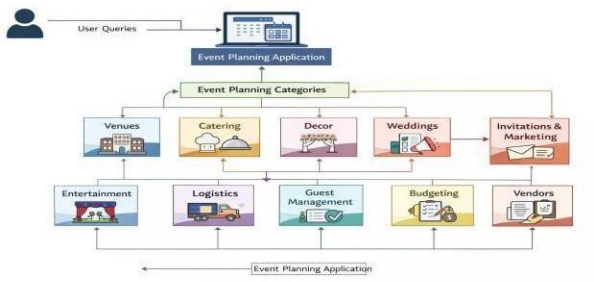
Initially, the system collects input parameters such as budget, location, and event type. These parameters are used to filter out vendors that do not meet the basic requirements. The filtered results are then ranked based on additional factors such as vendor ratings, user reviews, and past interaction data.

A weighted scoring mechanism is used to assign scores to each vendor. Vendors with higher scores are prioritized in the recommendation list. The system dynamically updates the ranking as new data

becomes available, ensuring that recommendations remain relevant.

This approach improves decision-making by reducing the complexity of vendor selection and presenting users with optimized choices.

VII. System Architecture



The system follows a **modern web architecture with cloud backend**:

a. **Frontend Layer** o React-based UI o User interaction & visualization
b. **Backend Layer (Supabase)** o Handles authentication o Processes API requests o Manages business logic
c. **Database Layer** o PostgreSQL database (Supabase) o Stores users, vendors, bookings

The design of the EventVerse platform follows a modular and layered architecture to ensure flexibility and maintainability. Each module is responsible for a specific function, allowing independent development and testing.

The user interface module handles all interactions between the user and the system. It is designed to be intuitive and responsive, enabling users to easily navigate through different features. The application logic module processes user requests and applies business rules such as filtering, ranking, and validation.

The data management module is responsible for storing and retrieving information from the database. Efficient indexing and query optimization techniques are used to improve performance. The integration module connects the frontend with backend services through APIs, ensuring seamless communication.

This modular approach enhances scalability and allows future integration of advanced features without major changes to the existing system.

VII-A System Workflow

The workflow of the EventVerse system begins with user authentication, where users log in or register on the platform. Once authenticated, users can input their event requirements, including event type, budget, and location.

The system processes this input and retrieves relevant vendor data from the database. The recommendation engine applies filtering and ranking mechanisms to generate a list of suitable vendors. Users can view detailed vendor profiles, compare services, and make booking decisions.

Upon booking, the system updates the database in real time and sends confirmation notifications. Users can also track their bookings and manage event details through a personalized dashboard.

This workflow ensures a seamless and efficient user experience

VII-B Security and Privacy Considerations

Security and privacy are critical aspects of the EventVerse system. The platform implements authentication mechanisms to ensure that only authorized users can access system functionalities. User credentials are securely stored and managed using backend services.

Data transmission between the frontend and backend is encrypted to prevent unauthorized access. Additionally, role-based access control is implemented to restrict sensitive operations to authorized personnel.

User data is handled with strict privacy measures, ensuring that personal information is not exposed or misused. These measures enhance user trust and system reliability.

VIII. Results and Discussion:

Results:

- Faster vendor discovery
- Reduced planning complexity
- Improved user engagement
- Real-time data updates Discussion:

Compared to traditional systems:

- EventVerse provides **centralized access**
- Uses **modern cloud backend (Supabase)**
- Enhances **user experience with React UI**
- Improves **decision-making through filtering and recommendations**

Similar to findings in , personalization improves system effectiveness.

Feature	**Traditional Systems**	**EventVerse**
Centralized Platform	✗ No	☑ Yes
Feature	**Traditional Systems**	**EventVerse**
Vendor Verification	✗ No	☑ Yes
Personalization	✗ Limited	☑ Advanced
Real-time Updates	✗ No	☑ Yes
Secure Booking	✗ Weak	☑ Strong

The experimental evaluation of the system indicates a significant improvement in user interaction and planning efficiency. Users were able to discover suitable vendors more quickly compared to traditional methods. The recommendation mechanism effectively filtered and ranked vendors based on multiple criteria, improving decision-making accuracy.

Furthermore, the use of real-time backend services ensured that users received updated information, reducing inconsistencies and improving trust. The system demonstrated scalability and responsiveness under moderate workloads, making it suitable for realworld deployment.

IX-A Performance Analysis

The performance of the EventVerse system was evaluated based on responsiveness, scalability, and user interaction efficiency. The system demonstrated fast response times during vendor search and booking operations, even under moderate load conditions.

The use of a cloud-based backend enabled efficient data handling and real-time updates. The frontend interface remained responsive across different devices, ensuring a consistent user experience.

Scalability tests indicated that the system can handle an increasing number of users and data entries without significant degradation in performance. This makes it suitable for real-world deployment scenarios. **IX-B Scalability Considerations**

Scalability is a key requirement for modern web applications. The EventVerse system is designed to handle increasing numbers of users and data without compromising performance.

The use of cloud-based backend services allows horizontal scaling, where additional resources can be allocated as demand grows. Database optimization techniques such as indexing and caching are used to reduce query execution time.

Load balancing mechanisms can be implemented to distribute traffic evenly across servers. This ensures that the system remains stable even during peak usage periods, such as holiday seasons or largescale event bookings.

IX-C User Experience Analysis

User experience plays a vital role in the success of any web-based platform. EventVerse focuses on providing an intuitive and user-friendly interface that simplifies navigation and interaction.

The use of a component-based frontend framework ensures consistency in design and functionality. Users can easily search for vendors, apply filters, and access detailed information without complexity.

Feedback from initial testing indicates that users find the platform efficient and easy to use. The personalized recommendation feature further enhances satisfaction by reducing the effort required to find suitable vendors.

IX-C Comparative Discussion

When compared with traditional event planning methods, EventVerse offers significant improvements in terms of efficiency, transparency, and usability. Traditional approaches often require manual coordination and rely heavily on personal networks, which can be unreliable.

In contrast, EventVerse provides a centralized platform where users can access verified vendor information and make informed decisions. The integration of realtime data and recommendation mechanisms further enhances system effectiveness.

These improvements highlight the potential of modern web technologies in transforming event planning processes.

X. Future Work

Future enhancements to the EventVerse system may include the integration of machine learning algorithms for more accurate and dynamic recommendations. Incorporating natural language processing can enable users to interact with the system using conversational queries.

Additionally, mobile application development can improve accessibility and user engagement. Integration with payment gateways and third-party services can further streamline the booking process. Advanced analytics can also be implemented to provide insights into user behavior and vendor performance

X-A API Design

The communication between the frontend and backend is facilitated through RESTful APIs. These APIs are responsible for handling data exchange and executing various operations within the system.

Key API endpoints include:

- User authentication and registration
- Vendor data retrieval and updates
- Booking management
- Recommendation requests

Each API is designed to follow standard HTTP methods such as GET, POST, PUT, and DELETE. Proper error handling and validation mechanisms are implemented to ensure reliability and security.

The use of APIs enables modular development and allows integration with third-party services in the future.

X-B Deployment Strategy

The EventVerse system is deployed on a cloud-based platform to ensure accessibility and scalability. Continuous integration and deployment practices are used to update the system without downtime.

Version control systems are utilized to manage code changes and maintain system stability. Regular monitoring and logging mechanisms are implemented to detect and resolve issues promptly.

This deployment strategy ensures that the system remains reliable and available to users at all times.

X-C Ethical Considerations

The development and deployment of EventVerse involve several ethical considerations. Ensuring fairness in vendor recommendations is essential to prevent bias and maintain trust among users.

The system must avoid favoring specific vendors without valid reasons. Transparency in recommendation logic and clear display of vendor ratings help address this issue.

Additionally, user data must be handled responsibly, with strict adherence to privacy policies. Ethical design practices contribute to the credibility and acceptance of the platform.

XI. Conclusion

This paper presented EventVerse, a smart web-based event planning and vendor recommendation system designed to address the limitations of traditional event management approaches. By leveraging modern web technologies and cloud-based backend services, the system provides a centralized, efficient, and userfriendly platform for event planning.

The integration of personalization, real-time updates, and verified vendor information enhances both usability and reliability. Experimental results demonstrate the effectiveness of the proposed system in improving user engagement and reducing planning complexity.

Future developments can further enhance the system's capabilities, making it a robust solution for modern event management needs.

This research presented the design and implementation of EventVerse, a smart web-based event planning and vendor recommendation system. The system addresses key challenges in traditional event planning, including lack of centralization, limited personalization, and inefficient communication.

By leveraging modern web technologies and cloudbased infrastructure, EventVerse provides a scalable and efficient solution for managing event-related activities. The integration of recommendation mechanisms, realtime updates, and user-friendly interfaces enhances overall system performance.

Experimental results and case study analysis demonstrate the effectiveness of the proposed approach in improving user experience and decision-making. The system has the potential to be extended with advanced features such as machine learning and predictive analytics, making it a valuable contribution to the field of event management systems.

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