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UNIEVENTS : A COLLEGE EVENT HANDLER USING AI

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Abstract: This research presents UniEvents, a comprehensive and intelligent web-based platform designed to simplify and enhance the management of university events. In modern educational institutions, events such as technical workshops, seminars, cultural festivals, and competitions play a vital role in student development. However, the management of these events often relies on fragmented communication channels such as notice boards, social media platforms, and messaging applications, which leads to inefficiencies, lack of coordination, and reduced student participation. These challenges highlight the need for a centralized and automated solution.

The proposed system, UniEvents, addresses these issues by providing a unified platform where students and administrators can interact efficiently. The system enables students to browse available events, view detailed information, register online, and receive real-time notifications regarding updates and reminders. For administrators, the platform offers tools to create, modify, and manage events, monitor registrations, and maintain organized records of participants. This reduces manual effort, minimizes errors, and improves overall event coordination.

A key feature of the system is the integration of an AI-based recommendation mechanism, which analyzes user preferences, browsing behavior, and past participation to suggest relevant events. This personalization enhances user engagement and encourages increased participation. Additionally, the platform incorporates a chatbot system that provides instant responses to user queries, assists with navigation, and offers guidance regarding event-related information, thereby improving user experience and accessibility.

The system is developed using the MERN stack, which includes MongoDB for database management, Express.js and Node.js for backend processing, and React.js for the frontend interface. This technology stack ensures scalability, flexibility, and efficient handling of large volumes of data. Security measures such as user authentication and data protection are implemented to ensure reliability and privacy.

The results of the implementation demonstrate that UniEvents significantly improves the efficiency of event management processes within educational institutions. It enhances communication, increases student participation, and provides a structured approach to handling events. Overall, the proposed system offers a modern, intelligent, and scalable solution that bridges the gap between traditional event management methods and current technological advancements.

1. INTRODUCTION

In the modern academic environment, universities and colleges regularly organize a wide range of events such as technical workshops, seminars, hackathons, cultural festivals, and competitions. These events play a crucial role in enhancing students' practical knowledge, soft skills, and overall personality development. They provide opportunities for

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students to explore their interests, collaborate with peers, and gain exposure beyond classroom learning. Despite their importance, managing these events efficiently remains a challenging task for many institutions due to the absence of a centralized and well-structured system.

Traditionally, event information is communicated through notice boards, emails, social media platforms, or messaging applications. While these methods are convenient to some extent, they often result in fragmented communication, lack of consistency, and missed updates. Students may fail to receive timely information about events, deadlines, or changes, which leads to reduced participation. On the other hand, organizers face difficulties in handling registrations, maintaining participant records, and ensuring smooth coordination. Manual processes also increase the chances of errors, data mismanagement, and duplication of work.

With the rapid advancement of technology, there is a growing need to adopt digital solutions that can simplify and automate event management processes. A centralized system can address many of the existing challenges by providing a single platform for both students and administrators. Such a system should not only manage events efficiently but also enhance user experience through intuitive design and real-time communication features.

In this context, this research introduces UniEvents, a web-based event management platform developed using modern technologies. The system allows students to browse available events, access detailed information, and register online with ease. Administrators are provided with tools to create, update, and manage events, monitor participation, and maintain organized records. By digitizing these processes, the system reduces manual effort and improves overall efficiency.

One of the key aspects of UniEvents is the integration of artificial intelligence to provide personalized event recommendations. By analyzing user behavior, preferences, and past participation, the system suggests relevant events, thereby increasing user engagement. Additionally, the inclusion of a chatbot feature enables users to receive instant assistance, making the platform more interactive and user-friendly.

Overall, the development of UniEvents aims to transform traditional event management practices into a more efficient, reliable, and intelligent system. It not only improves communication and organization within the institution but also encourages greater student involvement in various activities.

2. SCOPE

The scope of *UniEvents* focuses on providing a comprehensive and centralized solution for managing and participating in university-level events within educational institutions. The system is designed to serve multiple stakeholders, including students, faculty members, and event organizers, by offering a unified platform that simplifies the entire event lifecycle. It covers key activities such as event creation, promotion, registration, participation tracking, and communication, ensuring that all event-related processes are handled efficiently.

For students, the platform provides an easy-to-use interface where they can explore various types of events, including technical, cultural, academic, and extracurricular activities. They can view detailed information about events, register online, and receive real-time notifications regarding updates, deadlines, and reminders. This improves accessibility and ensures that students do not miss important opportunities due to lack of information.

For administrators and organizers, UniEvents offers tools to create, update, and manage events effectively. It enables them to monitor registrations, track participation, and maintain organized records of events and attendees. The system reduces the reliance on manual processes, thereby minimizing errors and saving time. It also improves coordination among different departments within the institution.

The integration of artificial intelligence expands the scope of the system by enabling personalized event recommendations. By analyzing user behavior, preferences, and past interactions, the system can suggest relevant events to users, thereby enhancing engagement and participation. Additionally, the chatbot feature extends the scope by providing real-time assistance, helping users navigate the platform and resolve queries instantly.

The system is implemented as a web-based application, making it accessible across various devices with internet connectivity. While the current scope is limited to a single institution, the system can be scaled to support multiple colleges or universities in the future. It can also be enhanced with additional features such as mobile applications, advanced analytics, online payment integration, and attendance tracking systems.

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Overall, the scope of UniEvents lies in transforming traditional event management into a more organized, efficient, and intelligent process, with the potential for future expansion and integration of advanced technologies.

3. OBJECTIVES

1. Centralized Event Management

The primary objective of UniEvents is to develop a centralized platform that brings all university events into a single system. This eliminates the need for multiple communication channels such as notice boards and social media, ensuring that all event-related information is organized, consistent, and easily accessible to users.

2. Simplified User Registration and Access

The system aims to provide a secure and user-friendly registration and login mechanism for both students and administrators. This ensures that only authorized users can access the platform while maintaining data integrity and enabling personalized user experiences.

3. Easy Event Browsing and Participation

UniEvents is designed to allow users to easily explore a wide range of events, view detailed descriptions, and register without complexity. This objective focuses on improving accessibility and encouraging greater student participation in various academic and extracurricular activities.

4. Efficient Event Creation and Management

Another important objective is to provide administrators with tools to efficiently create, update, and manage events. This reduces manual effort, minimizes errors, and ensures smooth coordination during event planning and execution.

5. Data Management and Record Maintenance

The system ensures proper storage and organization of user data, event details, and registration records. This structured data management enables easy retrieval, analysis, and long-term record maintenance.

6. Improved Student Engagement

UniEvents aims to enhance student involvement by providing easy access to event opportunities and simplifying the participation process. This contributes to the overall development of students by encouraging active engagement.

7. AI-Based Recommendation System

A key objective is to integrate an intelligent recommendation system that analyzes user preferences and past activities to suggest relevant events. This personalization improves user experience and increases participation.

8. Chatbot Integration for User Assistance

The platform includes a chatbot feature designed to provide instant assistance to users. It helps in answering queries, guiding navigation, and improving overall interaction with the system.

9. Scalability and Flexibility

The system is designed to be scalable and adaptable, allowing it to handle increasing data and users while also supporting future enhancements and potential expansion to multiple institutions.

5. LITERATURE REVIEW

1. Traditional Event Management Systems

Traditional methods of event management in educational institutions primarily rely on manual processes such as notice boards, paper registrations, and verbal communication. Studies have shown that these approaches are inefficient, time-consuming, and prone to errors. They often result in poor coordination and lack of proper record maintenance, highlighting the need for digital solutions.

2. Web-Based Event Management Platforms

With the advancement of web technologies, many institutions have adopted web-based systems for event management.

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These platforms allow users to access event information and register online. Research indicates that such systems improve accessibility and reduce manual effort; however, many lack integration of advanced features and user personalization.

3. Mobile Application Integration

Recent developments emphasize the use of mobile applications for event management. Mobile-based platforms provide real-time access to information and increase user engagement. Despite their advantages, studies suggest that maintaining synchronization between mobile and web platforms remains a challenge in many systems.

4. Cloud-Based Data Management

Cloud computing has been widely used to enhance scalability and data storage capabilities in event management systems. Research highlights that cloud-based solutions enable secure and flexible data access. However, concerns related to data privacy and security still exist and require careful implementation.

5. User Interface and Experience Design

Literature shows that user interface design plays a crucial role in the success of any web application. A simple, intuitive, and responsive design improves usability and encourages user participation. Poor interface design can lead to confusion and reduced engagement.

6. Automated Registration Systems

Automated registration systems have significantly reduced the dependency on manual processes. Studies indicate that such systems minimize errors, improve accuracy, and save time for both users and administrators. However, scalability issues may arise when handling large volumes of data.

7. Communication and Notification Mechanisms

Effective communication systems are essential for keeping users informed about event updates. Research highlights the importance of real-time communication features in improving participation. However, lack of personalization and delayed updates are common limitations in existing systems.

8. Data Security and Privacy Concerns

With the increasing use of digital platforms, data security has become a critical aspect. Literature emphasizes the need for secure authentication methods and data protection techniques. Many systems still face vulnerabilities, making security a major area of concern.

9. AI-Based Recommendation Systems

Artificial intelligence has introduced new possibilities in event management through recommendation systems. Studies show that AI can analyze user behavior and preferences to suggest relevant events. However, many existing systems do not fully utilize AI capabilities or lack accuracy in recommendations.

10. Chatbot Integration in Web Applications

Chatbots are increasingly used to enhance user interaction by providing instant responses to queries. Research indicates that chatbot integration improves user experience and reduces the need for manual support. However, their effectiveness depends on the quality of implementation and training.

11. Limitations of Existing Systems

Most existing event management systems lack integration of multiple features such as AI, chatbot support, and centralized data handling. They often focus on specific functionalities, resulting in incomplete solutions that fail to meet all user requirements.

12. Research Gap and Need for UniEvents

From the analysis of existing literature, it is evident that there is a need for a comprehensive system that integrates event management, intelligent recommendations, and user support features. UniEvents aims to address these gaps by providing a centralized, scalable, and user-friendly platform for efficient event management in educational institutions.

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4. PROPOSED METHODOLOGY

The proposed system, UniEvents is developed using a structured and systematic approach to ensure efficiency, scalability, and reliability in managing university events. The methodology begins with the requirement analysis phase, where the needs of both students and administrators are carefully identified. This involves understanding the limitations of existing systems and defining the functional and non-functional requirements of the platform. The goal is to design a system that simplifies event management while providing a seamless user experience.

Once the requirements are established, the system architecture is designed based on a three-tier model consisting of the presentation layer, application layer, and database layer. The presentation layer is responsible for the user interface, which is developed using React.js to ensure responsiveness and ease of use. The application layer is implemented using Node.js and Express.js, which handle the core logic of the system, including user authentication, event management, and data processing. The database layer utilizes MongoDB to store user information, event details, and registration records in a structured and efficient manner.

The working of the system follows a user-centric approach. Users interact with the platform through a web interface, where they can register, log in, browse available events, and complete event registrations. The backend processes these requests and communicates with the database to retrieve or store relevant data. Administrators have access to additional functionalities that allow them to create, update, and manage events, as well as monitor participant data.

A significant aspect of the methodology is the integration of an AI-based recommendation system. This component analyzes user behavior, preferences, and past participation to suggest relevant events. By implementing basic machine learning techniques, the system enhances personalization and improves user engagement. In addition to this, a chatbot module is incorporated to provide real-time assistance to users. The chatbot is designed to handle common queries, guide users through the platform, and improve overall usability.

The development process also includes testing and validation phases to ensure the system performs efficiently under various conditions. Functional testing verifies that all features work as intended, while performance testing ensures the system can handle multiple users simultaneously. Security measures, such as authentication and data protection mechanisms, are implemented to safeguard user information.

Overall, the proposed methodology ensures the development of a robust, scalable, and user-friendly platform. By combining modern web technologies with artificial intelligence, UniEvents provides an effective solution for managing university events in a streamlined and organized manner.

5. SYSTEM ARCHITECTURE AND DESIGN

The *UniEvents* system is designed using a **three-tier architecture**, which ensures clear separation of responsibilities, scalability, and efficient data handling. This architecture consists of the **presentation layer (frontend)**, **application layer (backend)**, and **database layer**, all working together to provide a seamless event management experience.

The **presentation layer** is the user-facing part of the system, developed using React.js. It provides an interactive and responsive interface where users (students and administrators) can perform various actions such as registration, login, browsing events, and managing event details. The design focuses on simplicity and usability, ensuring that users can navigate the platform easily without technical complexity.

The **application layer** acts as the core of the system and is implemented using Node.js and Express.js. This layer handles all business logic, including user authentication, event management, data processing, and communication between the frontend and database. When a user performs an action, such as registering for an event, the request is sent to the backend, where it is validated and processed. This layer also integrates advanced features such as the AI-based recommendation system and chatbot module. The recommendation system analyzes user behavior and suggests relevant events, while the chatbot provides instant assistance and improves user interaction.

The **database layer** uses MongoDB to store all essential data, including user profiles, event details, and registration records. MongoDB is chosen for its flexibility and ability to handle large volumes of data efficiently. The database ensures that information is stored securely and can be retrieved quickly when needed.

The interaction between these layers follows a structured flow. The frontend sends user requests to the backend through APIs, the backend processes the request and communicates with the database, and the response is sent back to the frontend

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for display. This separation of concerns improves system maintainability and allows for future enhancements without affecting the entire system.

Additionally, the system is designed to be scalable and flexible, allowing it to support a growing number of users and events. Security mechanisms such as authentication and data validation are implemented to protect user information and ensure system reliability.

Overall, the architecture of UniEvents provides a robust foundation for efficient event management, combining modern web technologies with intelligent features to deliver a high-quality user experience.

7. TECHNOLOGIES USED

1. Frontend – React.js

The frontend of UniEvents is developed using React.js, a powerful JavaScript library for building interactive user interfaces. It enables the creation of reusable components, making the application more efficient and maintainable. React provides a responsive and dynamic interface where users can easily browse events, register, and interact with the system. It also ensures smooth navigation and real-time updates without reloading the page.

2. Backend – Node.js and Express.js

The backend of the system is implemented using Node.js along with the Express.js framework. Node.js provides a scalable and efficient runtime environment capable of handling multiple requests simultaneously. Express.js simplifies the development of APIs and server-side logic. This layer manages core functionalities such as user authentication, event creation, registration processing, and communication between the frontend and database.

3. Database – MongoDB

MongoDB is used as the database for storing all system data, including user information, event details, and registration records. It is a NoSQL database that stores data in a flexible, document-oriented format. This makes it highly suitable for dynamic applications like UniEvents. MongoDB ensures fast data retrieval, scalability, and efficient data management.

4. AI Integration – Groq

The system integrates AI features using Groq to enhance user experience. Groq is used to implement intelligent functionalities such as event recommendations and chatbot support. It analyzes user behavior, preferences, and past activity to suggest relevant events. The chatbot powered by Groq provides instant responses to user queries, improving accessibility and interaction within the platform.

5. RESTful APIs

RESTful APIs are used to enable communication between the frontend and backend. These APIs handle data exchange efficiently and ensure that different components of the system work together seamlessly. They play a crucial role in maintaining the modular structure of the application.

6. Authentication and Security (JWT)

JSON Web Tokens (JWT) are used for secure user authentication. This ensures that only authorized users can access the system. Additional security measures such as input validation and error handling are implemented to protect data and maintain system reliability.

7. Development Tools and Environment

The development process utilizes tools such as Visual Studio Code for coding and Git for version control. These tools help in efficient development, debugging, and collaboration, ensuring a smooth workflow throughout the project.

8. WORKING

The UniEvents system operates through a structured workflow that connects students and administrators on a single platform to manage and participate in college events efficiently. The working of the system begins with the user accessing the web application through a browser. New users are required to register by providing basic details such as name, email, and password, while existing users can log in using their credentials. The system verifies the entered information through the backend and grants access upon successful authentication.

Once logged in, users are directed to the main interface where they can explore a list of available events. The platform displays detailed information about each event, including the event name, date, location, and description. Users can filter or browse events based on their interests and preferences. After selecting a particular event, users can view complete details and proceed with the registration process.

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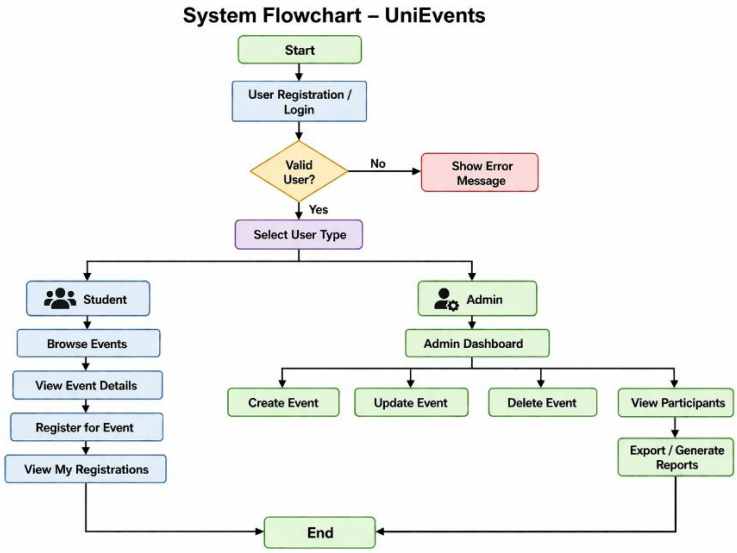
When a user registers for an event, the system sends the request to the backend server, which validates the data and stores it in the database. The registration is then confirmed, and the user can view their registered events through their profile. This ensures that all participation records are maintained in an organized manner.

On the administrative side, authorized users (admins) log into the system and access the dashboard. From this interface, they can create new events by entering relevant details, update existing events, or delete events that are no longer required. These changes are immediately reflected in the system and become visible to all users. Administrators can also view the list of participants for each event and manage the associated data efficiently.

A significant feature of the system is the integration of artificial intelligence using Groq. The AI component analyzes user behavior, browsing patterns, and past registrations to recommend relevant events to users. This personalized approach improves user engagement and helps students discover events that match their interests.

Additionally, the system includes a chatbot feature that provides real-time assistance. Users can interact with the chatbot to get information about events, registration procedures, or platform navigation. This reduces dependency on manual support and enhances user experience.

All interactions within the system follow a smooth flow between the frontend, backend, and database. User actions are processed by the backend, which communicates with the database to retrieve or store information, and the results are displayed on the frontend interface. This structured working ensures efficiency, reliability, and a seamless experience for all users.



The flowchart represents the working process of the UniEvents system. It begins with user registration or login, followed by validation of user credentials. Based on the user type, the system provides different functionalities. Students can browse events, view details, and register for events, while administrators can manage events and view participant data. The system ensures smooth navigation and efficient processing of user actions. The flow ends after the completion of user activities. This structured flow improves usability and ensures proper coordination between different system components.

9.IMPLEMENTATION

9.1 Home Page Screen:

The *UniEvents* system is implemented as a web-based application using the MERN stack, which includes MongoDB, Express.js, React.js, and Node.js. The implementation focuses on creating a user-friendly interface along with efficient backend processing to ensure smooth interaction between users and the system.

The frontend of the application is developed using React.js, which provides a dynamic and responsive user interface. It allows users to easily navigate through the platform, browse events, and interact with different features without page reloads. The home page of the system serves as the main interface and displays a list of available events along with essential details such as event name, date, and description.

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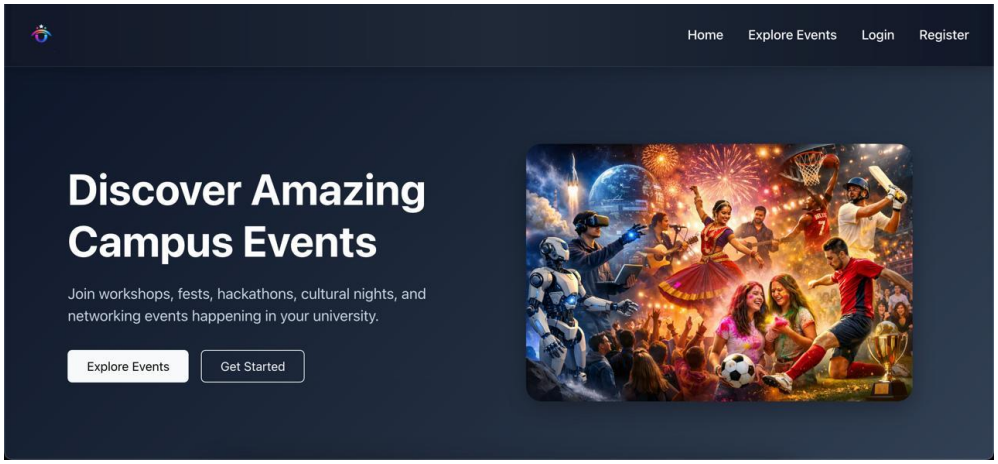

Fig 9.1: Home Page of UniEvents

The home page is designed to provide a clear overview of all events. It includes options for user registration and login, enabling secure access to the platform. Users can explore events based on their interests and view detailed information before registering. The interface is designed to be simple and intuitive, ensuring accessibility for all users.

The backend is implemented using Node.js and Express.js, which handle server-side logic and API development. When a user interacts with the frontend, such as viewing events or registering, the request is sent to the backend server. The server processes the request, performs necessary validations, and communicates with the database.

MongoDB is used as the database to store user information, event details, and registration data. Its flexible document-based structure allows efficient storage and retrieval of data. The backend retrieves data from MongoDB and sends it to the frontend in real time.

Additionally, the system integrates AI features using Groq to provide personalized event recommendations and chatbot support. The AI component analyzes user behavior to suggest relevant events, while the chatbot assists users by answering queries and guiding them through the platform.

Overall, the implementation ensures a seamless connection between frontend, backend, and database, resulting in an efficient, scalable, and user-friendly event management system.

10. RESULT

The implementation of UniEvents demonstrates a significant improvement in the way college events are managed and accessed by students and administrators. The system successfully provides a centralized platform that eliminates the need for multiple communication channels such as notice boards and social media, thereby reducing confusion and improving the availability of information. Users are able to access event details quickly and register without any complexity, which results in a more streamlined and efficient process.

One of the major outcomes observed is the increase in user engagement. The simple and intuitive interface allows students to easily browse events and participate in activities of their interest. The reduction in manual processes has also minimized errors related to registration and data handling. Administrators benefit from the system by being able to efficiently create, update, and manage events, as well as monitor participant information in an organized manner.

The integration of artificial intelligence using Groq further enhances the effectiveness of the system. The AI-based recommendation feature provides personalized suggestions to users based on their preferences and previous interactions. This encourages students to explore more events and increases overall participation. Additionally, the chatbot feature improves user experience by offering real-time assistance, helping users navigate the platform and resolve queries instantly.

From a technical perspective, the system performs efficiently with quick response times and smooth interaction between components. The use of the MERN stack ensures scalability and flexibility, allowing the system to handle multiple users simultaneously without performance issues. Data storage and retrieval through MongoDB are reliable and efficient, ensuring that user and event information is managed securely.

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Overall, the results indicate that UniEvents is a reliable and effective solution for modern event management in educational institutions. It improves communication, enhances user experience, and reduces administrative workload, making it a valuable tool for both students and organizers.

11. FUTURE SCOPE

The UniEvents platform presents significant potential for future enhancements and expansion, making it adaptable to the evolving needs of educational institutions and users. While the current system effectively manages college events through a web-based platform, there are several opportunities to improve its functionality, scalability, and user experience.

One of the major areas of future development is the creation of a **dedicated mobile application** for Android and iOS devices. A mobile app would provide greater accessibility and convenience, allowing users to receive instant updates and interact with the system anytime and anywhere. This would further increase student engagement and participation in events.

Another important scope lies in enhancing the **AI-based recommendation system**. Currently, the system provides suggestions based on user preferences and past interactions. In the future, more advanced machine learning algorithms can be implemented to improve accuracy and provide deeper personalization. The system can analyze behavioral patterns, trending events, and peer interests to generate more intelligent recommendations.

The **chatbot feature** can also be improved by incorporating advanced Natural Language Processing (NLP) techniques. This would enable the chatbot to understand complex queries, provide more accurate responses, and support conversational interactions. It can also be extended to handle multiple languages, making the system more inclusive and accessible to a diverse user base.

Another potential enhancement is the integration of **online payment gateways** for paid events. This would allow users to register and pay through the platform securely. Along with this, a **QR code-based attendance system** can be implemented to simplify event check-ins and reduce manual verification processes.

The system can also include **analytics and reporting tools** for administrators. These tools can provide insights into user participation, event popularity, and overall system performance. Such data-driven analysis can help organizers make better decisions and improve future events.

In terms of scalability, UniEvents can be extended into a **multi-institution platform**, allowing multiple colleges or universities to use the system. This would require enhancements in system architecture to support multiple users and databases efficiently.

Security can also be strengthened by implementing advanced authentication methods such as OTP-based login or biometric verification. This will ensure better protection of user data and system reliability.

Overall, the future scope of UniEvents lies in transforming it into a more intelligent, scalable, and feature-rich platform. By integrating advanced technologies and expanding its capabilities, the system can evolve into a comprehensive solution for event management across various institutions.

12. CONCLUSION

The development of UniEvents : A College Event Handler Using AI presents an effective and modern approach to managing university events through a centralized and intelligent system. This research highlights the limitations of traditional event management methods, such as scattered communication, manual registration processes, and lack of proper coordination. These challenges often lead to reduced student participation and increased workload for organizers. The proposed system successfully addresses these issues by providing a structured and user-friendly platform that simplifies the entire event management process.

UniEvents enables students to easily access event information, explore various opportunities, and register for events in a convenient manner. The system ensures that all event-related data is organized and accessible, eliminating confusion and improving communication within the institution. For administrators, the platform provides efficient tools to create, update, and manage events, as well as monitor participant details. This reduces manual effort and enhances overall coordination and productivity.

A significant contribution of the system is the integration of artificial intelligence using Groq. The AI-based recommendation system enhances user engagement by suggesting relevant events based on user preferences and

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behavior. This personalized approach encourages students to participate in more activities and improves their overall experience. Additionally, the chatbot feature provides real-time assistance, helping users navigate the platform and resolve queries efficiently. These intelligent features make the system more interactive and responsive.

From a technical perspective, the use of the MERN stack ensures that the system is scalable, flexible, and capable of handling multiple users simultaneously. The frontend provides a dynamic and responsive interface, while the backend efficiently processes user requests and manages data through MongoDB. Security measures such as authentication and data validation ensure the protection of user information and system reliability.

Overall, UniEvents demonstrates how modern web technologies and artificial intelligence can be combined to transform traditional event management into a smart and efficient digital solution. The system not only improves communication and organization but also enhances student engagement and participation. It provides a strong foundation for future enhancements and can be extended to support multiple institutions and advanced features. Thus, UniEvents proves to be a valuable and practical solution for managing college events in today's digital era.

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