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EVENT NEXUS: AN EVENT HANDLING APPROACH

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***Abstract*— Event Nexus, a cloud-based event management solution, is designed to simplify the process of planning, managing, and executing college events. Utilizing Spring Boot and MySQL for backend optimization and structured data storage, Event Nexus incorporates session management as well as role-based access control (RBAC). With the goal of reducing manual registration, eliminating communication barriers, and providing real-time event coordination, the platform is designed to address these shortcomings.**

Event Nexus provides users with the ability to create events, take part in quiz competitions, register individual and group events as well as receive real-time notifications, use of chat rooms, and automatically generate e-certifications through automated process. The system offers personalized dashboards for students, coordinators, and faculty members, facilitating efficient workflow and secure data retrieval. Through the use of WebSockets, participants and organizer can engage with each other through asynchronous communication.

By offering automated event scheduling, structured tracking of events and interactive participation management, Event Nexus enhances the process of coordinating events. It not only reduces the administrative burden, but also increases student engagement through its intuitive design and real-time analytics.'". In addition, it provides security through the use of encrypted storage for data and structured permission-based access.

By providing a comprehensive solution for academic event handling, Event Nexus helps colleges modernize event accessibility, streamline coordination, and improve event quality through data-driven insights.

Keywords— Event Management System, Spring Boot, MySQL, Role-Based Access Control, Session Management, Web Sockets, Real-Time Communication, Event Creation, Event Registration, Quiz System, E-Certificate Generation, Data Security, Automated Scheduling, Performance Optimization, Redis Caching, Real-Time Notifications.

I. INTRODUCTION

Farmers Fusion is an innovative agricultural e-commerce platform that strives to become a hub for connecting farmers with consumers. Using Spring Boot and MySQL, it provides a seamless marketplace where farmers can list their products and consumers can buy directly. The platform's efficiency, security, and ease of use make agricultural trade more accessible and transparent.

Despite agriculture being the foundation of many economies, farmers frequently encounter obstacles in reaching consumers. The use of multiple intermediaries in traditional supply chains leads to higher costs and lower profits for farmers. The direct-to-consumer platform of Farmers Fusion eliminates these inefficiencies, while still maintaining fair pricing and accessibility.

The platform has a Thymeleaf-based frontend that is responsive, layered RESTful services in Spring Boot, and incorporated MySQL database. Its architecture is multifaceted. Its arranged structure facilitate efficient data handling, allows for flexibility in scheduling, and facilitates user interactions'? Farmers Fusion integrates contemporary web technologies and enhances the overall user experience..

The multi-user authentication system at Farmers Fusion is a significant addition, providing users with the ability to interact with different roles within the platform, including farmers, consumers, and administrators. An open authentication system can accept a variety of login identifications, such as phone numbers or electronic contact

lists, email addresses, username information and unique alphanumeric IDs. Another security measure is provided by Aadhaar UID verification. The platform provides a user-friendly product management system for farmers, who can create detailed product descriptions. They can set stock levels, define per-purchase limits and display their products in multiple images.[]. Furthermore, farmers have the option to pay before picking up and after picking them up, which allows for more transaction flexibility. The new system.

Locally located agricultural products are easily found by consumers through location-based product listings, which reduces logistical obstacles. Farmers can specify convenient pickup points to retrieve their orders quickly, ensuring the smoothest buying process. The ability to reduce transportation expenses for farmers is advantageous for both consumers and producers.

In addition to online shopping, farmers Fusion offers social capabilities that help create a sense of community. ". Share and post, upload pictures (i.e. It helps the agricultural community by sharing knowledge, collaborating and networking.

With the help of business analytics tools, farmers can monitor sales and track product performance while also managing order management. Farmers can use this comprehensive dashboard to optimize their sales efforts by gaining valuable insights into customer preferences and decisions.

The enhanced shopping experience is facilitated by the inclusion of advanced product filters, detailed farmer profiles, and secure checkout options. The shopping cart feature ensures that orders arrive quickly, and order tracking provides valuable information to consumers at all times.

Besides farmers, consumers can also engage with social media by engaging with posts, responding to content, and staying up-to-date on agricultural news. The interactive ecosystem fosters trust and transparency in transactions between farmers and consumers, enhancing their relationship.

A robust platform oversight is guaranteed by the administration portal of Farmers Fusion. The administration includes the ability to oversee user accounts, moderate product listings and enforce pricing guidelines for agricultural products. By using the admin dashboard, you can ensure that all platform activities are carried out with strictness and efficiency.

Security is the main focus of Farmers Fusion. Access control is based on roles, which means that the platform locks users from accessing its content without permission and safeguards sensitive information. By implementing secure password management, data validation, and sanitization mechanisms, the platform provides a more secure environment for users.

The database architecture is optimized for efficient management of user profiles, product listings, order processing, and social interactions. The MySQL database is made up of 13 tables that are interconnected, ensuring data transactions are always on the safe and reliable side for the platform.

With soft delete, administrators can moderate content without the need for permanent deletion to maintain data integrity. This approach is particularly useful for ensuring regulatory compliance and platform governance, as it allows for actions that can be reversed.

Fair agricultural prices are ensured through the use of mechanisms that regulate price. The enforcement of price restrictions can prevent exploitation by administrators, which will result in consumers being able to afford their purchases while farmers remain profitable.

Modern web technologies are used to improve efficiency in the agricultural supply chain, with Farmers Fusion being a key component. By eliminating unnecessary intermediaries, reducing costs, and creating a direct link between producers and buyers, it fosters entrepreneurship.

It is part of a wider vision of digital agriculture where technology empowers farmers. Through the integration of e-commerce and social engagement, Farmers Fusion transforms traditional farming methods to better meet today's demands.

Ultimately, Farmers Fusion is a comprehensive solution that modernizes agricultural production. By leveraging its powerful feature set, secure architecture, and community-oriented approach, the platform empowers farmers, enhances consumer access, promotes a well-regulated agricultural marketplace.

The Giving Chain Donation Tracking System is a revolutionary approach to managing donations in the present day. The integration of security, transparency, and automation enables donors to donate securely while maintaining proper tracking and allocation of funds. It is a reliable, scalable and efficient platform for individual donors, charitable organizations or regulatory bodies to enhance the entire giving experience.'

II LITERATURE REVIEW

There have been significant changes in event management within academic institutions Conventional event management involved manual processes, physical registrations, and offline communication, which hindered coordination and participation tracking. The emergence of digital event management solutions has led institutions to adopt automated platforms for event organization. Current research indicates the use of automation in event management. An investigation into automated digital event handling platforms reveals that these systems reduce administrative workloads by 40%, increase communication efficiency, and boost event success rates. Even though event management solutions offer these benefits, they are typically

not tailored to academic institutions that require access control and real-time engagement.

The commercial event management platforms Eventbrite and Quizizz are among the many available digital solutions that can be used for event planning purposes. Nonetheless, these platforms are mostly focused on general event planning and do not offer academically specific functionalities such as role-based access control, student participation tracking, and real-time notifications that are appropriate for educational contexts.

A system that facilitates effective collaboration between faculty, coordinators, and students is essential for managing academic events in accordance with institutional workflows. Studies of role-based access control (RBAC) in educational contexts show its importance in ensuring structured event participation. Research indicates that RBAC enhances security, prevents unauthorized changes, and improves system performance by restricting features based on user roles. To ensure a seamless event experience, Event Nexus utilizes RBAC to assign different access levels to students, coordinators and faculty. A significant element of digital event management involves real-time communication. According to a 2019 study, integration of WebSocket-based messaging systems improves event coordination and increases user engagement in real time applications.

Emails and bulletin board announcements, which are common forms of communication that delay updates and cause confusion for participants. To ensure efficient event coordination, Event Nexus integrates WebSockets to offer instant notifications and a chat system. Academic event management faces another significant issue of participation tracking

A significant number of institutions do not possess adequate means to monitor attendance, quiz results, and student engagement. Several studies have found that automated attendance tracking and performance analytics can improve event organization and provide valuable insights for future planning. Event Nexus provides coordinators with real-time participation tracking and data visualization to evaluate the event's success. Why is this important? Another important aspect of academic event management is the generation of e-certificates.

Manual design, printing and distribution are the traditional methods for issuing certificates; however, these processes can lead to administrative delays. Investigations into self-generated certification demonstrate that digital certificates reduce processing time, promote credibility and make learning more accessible to students. Through the use of automated issuance, Event Nexus facilitates the immediate download of verified certificates.

The study of digital event management has placed significant emphasis on security and data privacy. Institutions are required to safeguard sensitive student data, which requires secure authentication and encrypted storage solutions. Recent cybersecurity developments suggest that user information should be protected by encrypted databases, access control policies and data protection regulations. Secure data handling is a key aspect of Event Nexus' data protection policies, which include provisions for personal and academic data.

The literature highlights the importance of a specialized academic event management system that incorporates automation, security, real-time engagement, and structured access control. Unlike other solutions, Event Nexus provides a customized solution for academic institutions.

Using cutting-edge technology, the platform improves event coordination, reduces administrative burden and creates an engaging digital event experience for students and faculty alike. Research on digital event management reveals the potential for efficiency improvements through automation, security, and role-based access control (RBAC). Research also suggests that real-time communication tools, such as WebSockets, can improve engagement and coordination. Event Nexus merges these principles to create a customized solution for academic institutions.

III. PROPOSED SYSTEM

By offering integrated automation, real-time communication, and structured access control for academic event management through Event Nexus. The system's objective is to eliminate the complexity of event management by offering a centralized solution that streamlines participant participation and execution. A modular platform is employed to guarantee its flexibility and scalability.

The modules are tailored to meet the needs of event management, covering roles based on access, organizing events, tracking participation, and awarding certificates. The event experience for students, faculty, and coordinators is made more enjoyable and smooth by these features. Among the core features of Event Nexus is its role-based dashboard system. Individual users, such as students, coordinators or faculty, are all given bespoke access permissions.

By restricting functionality based on user roles, structured access ensures secure operations and improves user experience. Using the creation and registration system, event coordinators can create, modify, and oversee event information such as name type, duration, or eligibility requirements. This is an essential tool for organizing conferences. Participants can view upcoming events, sign up as both individual and a team, and receive immediate confirmation upon registration.

All other options are available. This means less manual paperwork, and quicker processing time. Real-time engagement is achieved through the integration of WebSocket-powered notifications and chat functionality into the platform. This allows participants to receive immediate updates, reminders and alert is sent by coordinator. Additionally, the built-in chat system promotes cooperation by facilitating communication between event attendees and organizer.

The interactive learning experiences are further enhanced by the inclusion of a module for "quiz and competition management", in which coordinators can design and deliver their own quizzes on the platform. Students have the opportunity to take quizzes, view results, and track their progress. With its ability to automatically grade and create leaderboards, this feature is a valuable addition to educational or competitive events.

One of the key features of Event Nexus is its ability to generate e-certificates automatically. Those who have successfully completed an event or competition are automatically given digital certificates by the system. They can be easily stored indefinitely and downloaded anytime, eliminating the need for manual certificate distribution.

Event Nexus utilizes encryption for data storage and access control to maintain the integrity of its system. Secured access to personal user information, event logs, and quiz results ensures that the data is not exposed to third parties. The system's dependability is further enhanced by implementing data protection policies.

Moreover, the performance analytics and reporting component delivers significant insights into trends in event participation levels; user engagement; overall efficiency of systems.

Detailed reports can be provided to coordinators and faculty members to help evaluate the success rates of events, as well as feedback from participants.

The architecture of Event Nexus is scalable to allow for future enhancements. There are several potential improvements, such as AI-driven event recommendation suggestions for events, integration with mobile apps, and blockchain-based certificate verification to improve security and user experience. These advanced features are utilized by Event Nexus to simplify the process of managing academic events through data-driven approach.

It cuts enormous administrative costs, increases student engagement and ensures a seamless event experience for all stakeholders.'". It offers: Individual dashboards for students, coordinators and faculty can be created in a Role-Based Mode (RMO). Coordinators are responsible for organizing and overseeing events, whereas students can register as individuals or in teams.

A Quiz System: Automated quiz generation, participation tracking, and performance measurement. Both event attendees and awardees receive digital certificates to use for obtaining events. Use WebSocket for real-time notifications and instant chat.... Enhanced security measures include restricted access with regard to roles and encrypted data retention.

IV. WORK FLOW

Event Nexus' workflow is designed to ensure a seamless and intuitive user experience for all attendees. It is organized in a structured manner that ensures efficient event organization, participation and communication. The aim of each step is to promote automation, decrease manual labor usage and improve the overall user experience. To register and authenticate themselves, users (such as students, coordinators or faculty) must provide their credentials.

The approval of coordinators and faculty members is mandatory for their respective roles before they can be employed. Upon registration, users access the site using an encrypted authentication system that guarantees role-based entry.

Managing Events: Coordinators can use a dashboard to create events by specifying the type of event, description, date, and eligibility requirements. Furthermore, they can establish individual or group participation options, determine registration deadlines, and oversee event publicity.

Through an interactive interface, students can browse available events and register and confirm their participation. Their interests and eligibility are the basis for registering for events. Registration is confirmed and event registration can be viewed on the participant's dashboard.

Real-time notifications are integrated into the platform to inform users. Using WebSockets means that participants can receive immediate updates on event details, schedule changes, or important announcements. Coordinators can send bulk notifications to all registered participants for maximum efficiency.

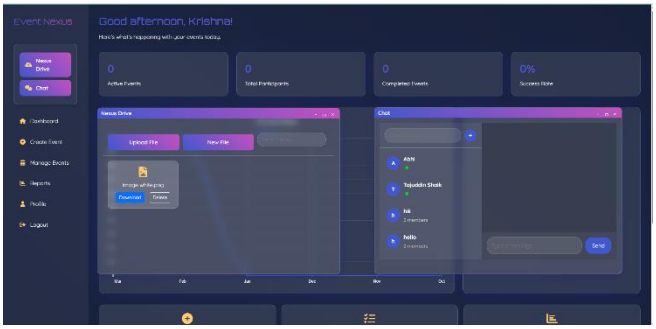

Fig 1 coordinator dashboard with chat and drive features

It also provides an integrated quiz system for events that include quizzes or coding competitions. Quiz-taking can be done in an organized manner, with scores being evaluated automatically and results posted on leaderboards. Reports on performance can be generated and scores for participants tracked by coordinators.

Attendance tracking and monitoring can be done digitally by event coordinators to ensure accurate participation records on the day of the event. During virtual events, attendance can be verified by automatic check-in mechanisms through system logs. Live Chat and Discussion Forum: Join the conversation between participants and organizers of the event in real time. In the dedicated chat section, students can ask questions, discuss event-related topics and engage with coordinators. It fosters cooperation and increases participation.

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Following the completion of an event, the system generates digital certificates for participants and distribute them automatically. With a single click, coordinators can approve and distribute certificates. Registrants can download their certificates directly from their dashboard, providing effortless and rapid access.

The event success of the participants is evaluated through rating and survey forms, with analytics being used to provide feedback. Dashboards with analytics are available to coordinators to assess participant engagement, event popularity, and areas that require improvement. Moreover, they provide information on participants' behavior during the registration process.

The platform's data handling features encrypted storage and regular backups, which helps to ensure data security and system maintenance. Permissions are based on a hierarchy, which prevents unauthorized access, and performance monitoring tools are used to maintain system stability and responsiveness. The organized workflow of Event Nexus delivers an engaging and efficient event management solution, promoting automation in academic event coordination while maintaining accessibility. 2.

The coordination of events involves the organization of event scheduling, the establishment of participation standards, and the approval of registrations. 3. The system tracks attendance, engagement, and quiz results through Participation Tracking.... 4. Coordinators can send event updates through chat while students receive notifications, resulting in real-time communication. 5. Certificate distribution: After the event is finished, certificates are generated and distributed automatically.

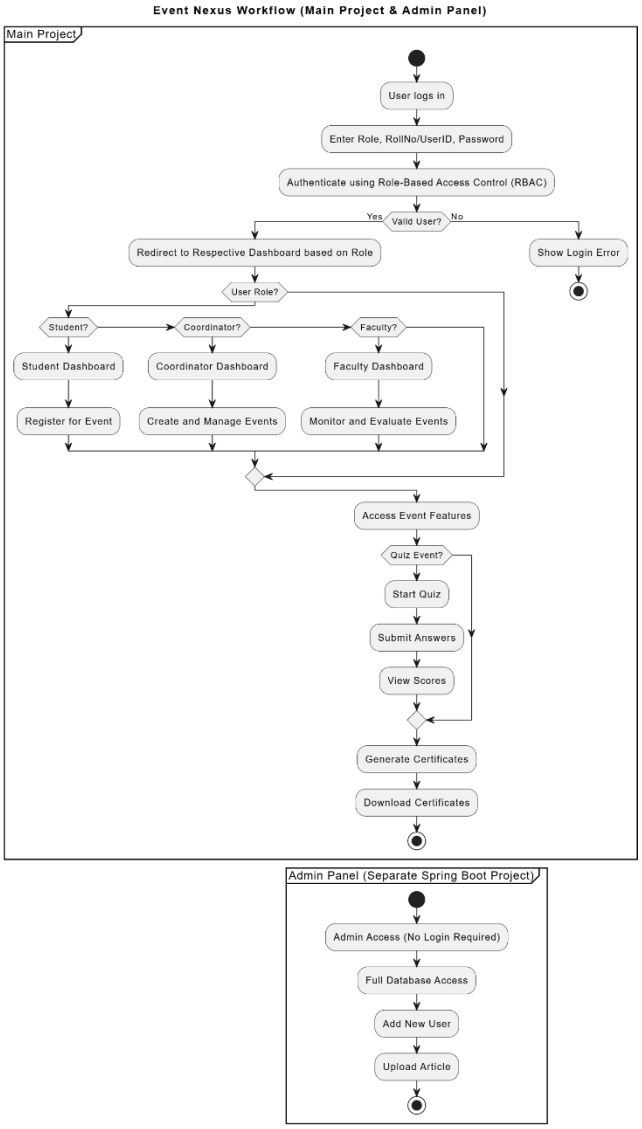
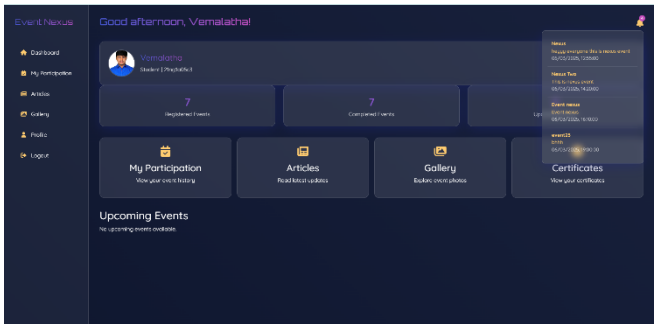


Fig 2 Project WorkFlow

V.TOOLS USED



Event Nexus employs a blend of contemporary technologies and frameworks to guarantee scalability, security, and efficiency. Different tools are utilized to optimize various features of the platform. By utilizing Spring Boot, a Java-based framework, it is possible to build scalability and ease application development by providing built-in features for dependency injection, RESTful API handling, and security

configuration. Spring Boot is a fast-paced development platform that guarantees scalable and modular system architecture.

MySQL is a relational database system that uses structured relations to store and manage user profiles, event details, quiz records, and attendance tracking data. Efforts are made possible to query efficiently through the use of an optimized database schema, which ensures data handling and retrieval. Using Spring Boot, the user interface is created using Thymeleaf and an integrated template engine. Web pages with interactive elements can be rendered dynamically. The use of HTML, CSS, and JavaScript enhances the user experience by ensuring that their content is visually appealing and responsive.

Real-Time messaging and notifications are made possible through the use of WebSockets by Event Nexus. Organizers can communicate with participants in real-time, providing instant feedback and opportunities for networking during the event. Additionally, this feature facilitates discussion forums. Event Nexus utilizes Spring Security and session-based authentication. How is this security managed in session management?

Role-based access control (RBAC) is used to ensure a secure and well-organized system by assigning different functions to students, coordinators or faculty. Encrypted storage and access control are utilized by the platform to safeguard sensitive user information. System integrity is maintained by ensuring data validation and structured access permissions prevent any changes that are not authorized. By utilizing GitHub and Docker, version control is managed within the project, making it possible to collaborate on projects.

VI. RESUT AND DISCUSSION

By automating essential processes, reducing administrative burden and improving the experience for participants, Event Nexus has demonstrated its success in academic event management. ". The platform simplifies the entire event management process, from registration to certification, removing the manual labor required for managing events. The effectiveness of registration and tracking for events is a significant finding.

By offering a user-friendly and organized interface, the system simplifies the process of registering for events, significantly decreasing registration errors and delays. Participants can experience enhanced participation by receiving automated confirmation emails and real-time updates regarding changes and event schedules. The adoption of role-based access control (RBAC) has resulted in improved security and efficiency of workflows. Coordinating

Fig 3 Student Dashboard

teams have access to specific features for event management, while students are limited to using the platform's relevant sections. The implementation of this structure prevents unauthorized changes and ensures smooth event execution. By enabling live chat and providing notifications, organizers can now communicate more effectively with attendees. Misuses of traditional communication methods, such as email and notice boards, often result in delayed or missed updates. Instant notification is made possible through the use of WebSockets, allowing for timely dissemination of event information. Performance testing shows that this platform can handle multiple concurrent user interactions with minimal latency.

Rapid retrieval of event information, registrations, and participation records is made possible by the optimized database architecture. Event Nexus can accommodate a growing number of users without any performance limitations due to its scalability. Another major advantage of the system is automated e-certificate generation. Previously, institutions had to manually design and distribute

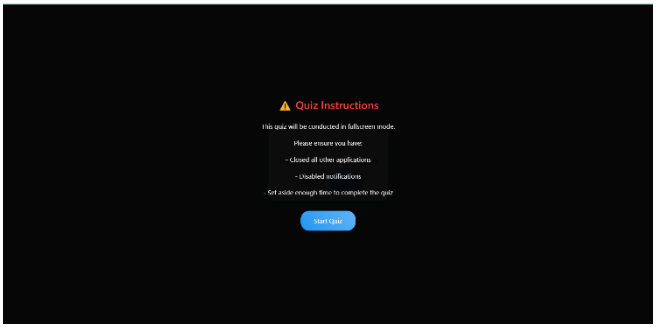


Fig 4 Quiz Starting Page

participation certificates, leading to delays and administrative burdens. Events can be completed on an event using Event Nexus, resulting in certificate generation automatically, which reduces workload and increases satisfaction among participants.

It integrates data analytics and reporting tools, which are useful for event planner. Why? During the event, coordinators can monitor attendance patterns and gauge student interest.These insights can assist in preparing for future event management and outreach efforts. Security is still the primary concern for Event Nexus.

This is achieved through the use of data encryption to prevent unauthorized access to user data, as well as strong authentication mechanisms and structured permissions.

The system adheres to best practices in terms of cybersecurity, safeguarding sensitive academic data. At first, users have given it a lot of attention, with students saying that the process of finding and signing up for events is straightforward, and coordinators say that their administrative work has been greatly reduced. Organizations can streamline their event planning, increase participation, and coordination by utilizing new methods.

The overall approach of Event Nexus is to tackle the challenges faced in managing academic events by utilizing state-of-the-art technologies to improve efficiency, security,

and user engagement. With its automation capabilities and real-time features, the platform is a powerful tool for managing digital events in educational facilities. By offering real-time notifications and seamless communication, the system enhances student engagement. Through performance testing, it is demonstrated that the platform can handle simultaneous user interaction effectively, and its database queries are optimized for rapid response.

VII. FUTURE SCOPE

Future developments for Event Nexus include better user experience, scalability and other new cutting-edge technologies that will make academic event management more efficient with ease and speed. ". AI-based event recommendation is a promising new direction. The system can recommend events that are relevant to students by analyzing their user behavior, participation history, and preferences, which can lead to higher engagement and attendance. Machine learning algorithms can be used to tailor events, ensuring students are aware of events that are relevant to them. A special mobile app has been developed specifically for Event Nexus, which is a significant advancement. The web-based system in place is effective, but a mobile app would be more accessible and user-friendly. Why?

The implementation of events, reminders, and push notifications for real-time messaging would enhance communication and user engagement. Integrating advanced analytics and data visualization tools would enable coordinators and faculty to gain greater insights into event participation patterns, student engagement rates, and performance metrics. With these insights, institutions can improve event management, enhance event experience and quality control measures, and make informed decisions based on data. Certificate verification could also benefit from the use of blockchain technology.

By utilizing blockchain, Event Nexus can ensure that e-certificates are both valid and unchanging. Certifaction could be achieved easily by institutions and employers without requiring centralized verification processes. It can also be expanded by exploring integrations with third-party APIs.el. A more seamless event management experience and a unified academic experience would be achieved by integrating with existing Learning Management Systems (LMS), calendar applications, or payment gateways. Automated event moderation and filtering capabilities are also available for Event Nexus. AI-led moderation tools can help filter out inappropriate content from discussion forums, maintain a professional atmosphere and comply with institutional norms. As the platform grows, it will require more scalability improvements.

By utilizing microservices architecture, it would be possible to deploy and update individual components on their own, while also improving system reliability and performance. Security measures such as biometric authentication and MFA can be implemented to ensure secure access to sensitive information, including user accounts. In addition, the platform could incorporate collaboration tools in real time, such as live video streaming and interactive webinars, to accommodate hybrid and fully virtual events.

This would enhance its flexibility. By incorporating future enhancements, Event Nexus will be a platform that is more intelligent, secure, and user-friendly for academic event management as it continues to evolve with the students and educational institutions. Event suggestions:

Machine learning algorithms can recommend events based on student preferences using AI-powered tools. Integrated Mobile App: A separate mobile application to make it more accessible. Advanced Analytics provides enhanced data visualization tools for event performance insights.... Verifiable certificates through decentralized verification using blockchain technology.... Connecting to third-party APIs and enabling extended functionality.

VIII. CONCLUSION

Event Nexus has successfully addressed the inefficiencies associated with traditional academic event management by offering a structured, automated, and user-friendly platform. By integrating role-based access control, real-time communication, automated event tracking, and secure data management, the system ensures a seamless and efficient event handling experience for students, coordinators, and faculty.

The platform's ability to automate event creation, participant registration, quiz management, and e-certificate generation has significantly reduced administrative workload. Institutions can now conduct events more efficiently, ensuring timely execution and improved student engagement.

The inclusion of WebSockets for real-time notifications and chat functionalities has enhanced communication, eliminating delays commonly found in traditional event coordination methods.

Security remains a core focus of Event Nexus. By implementing encrypted data storage, structured permissions, and secure authentication mechanisms, the system ensures that user data is protected from unauthorized access. These measures comply with best practices in cybersecurity, making the platform reliable for institutional use.The analytics and reporting features provide valuable insights into event participation, engagement trends, and overall system performance. This allows institutions to refine event planning strategies, optimize resource allocation, and improve future event execution based on data-driven decisions.

One of the key highlights of Event Nexus is its scalability. As institutions expand their event management needs, the platform's modular architecture allows for future enhancements, including AI-powered event recommendations, blockchain-based certificate verification, and mobile application integration. These advancements will further strengthen the system's capabilities, making it a long-term solution for academic event handling.

Initial feedback from users has been overwhelmingly positive. Students appreciate the ease of discovering and registering for events, while coordinators benefit from the system's automation and structured workflow. The system's ability to handle multiple users concurrently without performance degradation highlights its robustness and efficiency.

In conclusion, Event Nexus stands as a modern, scalable, and secure solution for digital event management in educational institutions. By continuously evolving with emerging technologies and user requirements, it has the potential to become the standard for academic event handling, fostering greater student participation, seamless coordination, and overall institutional efficiency.

Event Nexus provides a transformative solution for academic event management by integrating automation, security, and real-time engagement tools. Its role-based dashboards, secure authentication, and interactive features create an efficient and streamlined workflow for students, faculty, and coordinators. Future developments in AI and blockchain integration could further enhance its capabilities, making it a scalable and sustainable solution for digital event management in educational institutions.

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We extend our heartfelt thanks to the faculty mentors and administrative team who provided constant support and advice during the course of establishing Event Nexus. They have provided valuable insights and feedback to refine the platform, which has proven effective in managing academic events.. We are grateful to the students, coordinators, and faculty who participated in the testing phases, provided constructive criticism, assisted with improving the system's functionality, etc.

They were instrumental in the creation of the final version for Event Nexus. Furthermore, we recognize the valuable role played by the open-source developer community in facilitating this platform's development with their resources and frameworks. It has been greatly improved by the implementation of technologies including Spring Boot, MySQL (a popular database management system), WebSockets, and Thymeleaf. Finally, we want to acknowledge the great blessings and support given by our institution that allowed us to undertake this research and development endeavor.

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