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Campushub Smart AI

Mahesh R[1]
Student, Department of BCA
St. Francis College
Bengaluru

Divya J[2]
Assistant Professor, Department of BCA
St. Francis College
Bengaluru
Corresponding email: jdivya1805@gmail.com

ABSTRACT

College event management deals with diverse activities relating to announcing events, registering the participation of students, recording attendance, sending notifications, and issuing certificates. These activities are complex to operate independently to maintain consistently information about events and participate in the complete lifecycle of participation. CampusHub Smart AI is a web application that provides a unified mode of operation for these activities. The application provides separate dashboards for students and administrators according to the user roles. Students can view upcoming events, register for a programme, view registration details, receive notifications, engage with clubs and access approved certificates. Administrators can add and manage events and clubs, view student registrations, mark attendance, issue notifications and approve certificates. The application is developed using React and Vite as the front end, Node.js with the Express.js framework as the back end, and MySQL as the database. The application features an AI-based student assistant chatbot to help students fetch event-related information. The interface uses responsive design to provide a seamless experience on desktop and mobile browsers. The literature survey shows that event management, attendance, digital certificates, notifications, and educational chatbots have been commonly studied as a single domain. CampusHub Smart AI converges these features in a college-oriented workflow, binding registration and attendance, certificate approvals and an event-focused student assistant.

Keywords: CampusHub Smart AI, Event Management, Student Engagement, Attendance Management, Artificial Intelligence



Fig.1. Overview of CampusHub Smart AI – Unified Platform for College Event Management

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1. INTRODUCTION

College events are an important aspect of student participation, communication and co-curricular engagement. However, the information associated with an event is fragmented among multiple activities: announcing the event, collecting registrations, participant information maintenance, attendance recording, updates communication and certificate provision. Separation of these processes entails using different channels by students, and repeated record maintenance by the administrators. This calls for a unified college-oriented platform that can manage the event lifecycle from registration to post-event certification.

Existing research has explored sustained interests in web-based event management, registration, attendance systems, digital certificates, notifications and educational chatbots. For example, web event-management studies have addressed event creation, registration and notifications, while e-Vent combined event registration with QR validation and electronic certificates. Attendance research has explored QR-based and web-based approaches, whereas certificate research has looked separately into verification and authenticity. Educational chatbot studies have focussed on student support, frequently asked questions and institutional information. [1]–[7].These studies provide useful solutions for individual functions, but the literature survey done for this work suggests that the functions are treated as separate systems. The survey includes 28 papers on event management, smart campus systems, student engagement, attendance, digital certificates, chatbots and communication. Out of these, 18 were marked as fully verified and 10 as needing confirmation. The survey is based on mostly retrieved abstracts and records and is therefore used as a focused literature review and not an exhaustive one.

2. PROBLEM STATEMENT

The management of college or campus events tends to be fragmented. Announcements may be made on notice boards or chat groups, registration can be collected separately, and attendance needs to be marked separately again, with certifications requiring another step for approval. Students thus do not have a unified interface to view all their activities, while college administrators should not have to deal with disparate data silos. The problem that Campus Hub Smart AI solves is that there is a lack of such unified and role-specific digital interface for managing such an event lifecycle.

3. OBJECTIVES

- To provide a unified web platform for managing college events and related student activities.
- To provide separate student and administrator dashboards with role-based functions.
- To allow students to view events, register for programmes, track registrations, receive notifications and access approved certificates.
- To allow administrators to create and manage events and clubs, view registrations, record attendance, send notifications and approve certificates.
- To connect attendance and certificate approval within the same event participation workflow.
- To provide an AI-based student assistant for event-related information.
- To provide a responsive interface suitable for desktop and mobile browsers.

4. LITERATURE REVIEW

The literature survey was classified into eight overlapping categories, namely, event management systems, smart campus or university management, student engagement and registration, attendance management, digital certificates, AI chatbots or student assistants, notifications and communication, and supporting technologies. This classification is based on the idea that a paper may make contributions to several areas of function.

Study	Focus	Key contribution	Relevance to CampusHub
A Web basedCollege Event Management System and Notification Sender [1]	Event management	Web event handling, registration visibility and alerts	Supports event and notification modules
e-Vent [2]	Registration & certificates	QR-based registration validation and ecertificates	Supports registration-tocertificate workflow
Siew et al. [3]	Attendance	Web attendance using face recognition/QR with central database	Supports centralized attendance concept
Manoj & Joshi [4]	Certificates	Blockchainoriented certificate verification	Shows importance of certificate authenticity
Ifeyemi et al. [5]	Digital certificates	QR verification and revocation using blockchain	Provides background for digital certificate handling
Okonkwo & AdeIbijola [6]	Educational chatbots	Systematic review of chatbot applications in education	Supports chatbot design rationale
Dinh & Tran [7]	University chatbot	AI-based university information chatbot	Closest background for eventinformation assistance
Benavides et al. [8]	Digital transformation	Systematic review of HEI digital transformation	Supports integrated-platform motivation

Event management research indicates that the use of online registration and notification could help in reducing the amount of manual effort needed for event management. The e-Vent paper provides an example of an event registration system with QR scanning and electronic certificate distribution; however, the scope of this system is limited to the event registration process itself. Attendance-related studies, such as the one by Siew et al. and other QR-based approaches also focus on attendance capture exclusively, while most digital certificate research deals with verification, authenticity, and revocation, without addressing the full scope of an event.

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Educational chatbot study serves as the second source of evidence. The two systematic reviews indicate that chatbots are utilized for educational purposes and information on the institution, while the analysis of the university chatbots highlights the possibility of combining conversation tools with the information on the organization. The literature search revealed that most of the university chatbots are centered on addressing FAQs, general admission, or resource finding, not event management. Thus, the CampusHub assistant will be concentrated on providing student information related to events.

5. RESEARCH GAP

Based on the reviewed literature, five research gaps were identified. First, event management systems are often presented as separate applications, whereas certificate systems are also treated as independent modules. Second, the majority of university chatbots are designed to deliver frequently asked questions and provide assistance with admissions or other general queries, and rarely are they used to organize and operate events. Third, in terms of attendance systems, most solutions only allow for marking presence, whereas rarely do they establish connections between attendance and subsequent outcomes, such as grades. Fourth, in terms of higher-education digital transformation, the reviewed articles provide broad views on smart campuses, but few discuss integrated approaches in operational contexts. Finally, whereas there is research on event recommendation, none of the reviewed articles report an actual college-portal implementation of such a module.

The proposed CampusHub aims to address the first four research gaps, as it integrates event registration, attendance, certificates, and notifications, as well as student support with clubs and events. Event recommendation is identified as a future research direction, which is why it is included in the list of features under “to be developed.” Lastly, since the search was conducted via databases, which only provide abstracts and selected content, these research gaps are based on the information made available by the authors of the reviewed articles, which should be considered with due caution.

6. PROPOSED SYSTEM

CampusHub Smart AI is developed as a role-based web application, which has two areas: student and administrator. Students can view upcoming events, register for them, check event registration details and notifications, learn about clubs, and approved certificates. The administrator area allows managing events and clubs, viewing event registrations, attendance marking, notifications, and certificate approvals. Thus, both sides have their features to ensure a single application for managing events. The event life cycle starts with creating events, then students find them, register for them, attend them, get their certificates approved, and view them. Additionally, notifications are available to manage any event-related information, and an AI-based student assistant helps students with the event-related questions.

7. SYSTEM MODULES

Module	Function
Student Dashboard	Displays upcoming events and provides access to registrations, notifications, clubs, certificates and the event assistant.
Event Management	Allows administrators to add and manage event information and allows students to discover relevant events.
Registration Management	Records student participation in events and allows students to view their registration details.
Attendance Management	Allows administrators to record attendance for registered participants.
Certificate Management	Allows administrators to approve certificates and provides students access to approved certificates.
Notification Management	Supports event and activity-related communication to students.
Club Management	Provides access to college club information and supports administrative management of clubs.
AI Student Assistant	Provides conversational assistance for event-related information.

8. WORKFLOW

The proposed work flow starts with the administrator creating an event. The students can view the event on their student dashboard and sign up. The signed up information will go into the administrator’s event records. The administrator marks who attended the event. Then the administrator approves certificate issuance, which makes the certificate appear in the corresponding student’s list of available certificates. Notifications keep everyone posted on what’s going on with the events, while the assistant acts as another channel for students to get information about events..

EVENT CREATION → REGISTRATION → ATTENDANCE → CERTIFICATE APPROVAL → CERTIFICATE ACCESS

9. METHODOLOGY

The study is structured according to the design-and-development methodology guided by a literature review. Initially, the literature review was performed to explore the existing approaches and limitations of event management, attendance, certificates, notifications and educational chatbots. The research gaps were further translated into a set of functional requirements for an integrated college event platform. The system was then built with React and Vite as the frontend framework, Node.js, Express.js and MySQL as the server-side components, and MySQL as the database. Functional requirements were grouped into student- and administrator-oriented features. The former includes event browsing and registration, whilst the latter incorporates attendance management, notifications, certificate approvals, and database access. The interface was further developed to be responsive to provide a consistent user experience on desktop computers and mobile browsers. Finally, the system was evaluated functionally using a set of test cases related to authentication, event creation, browsing, registration, registration confirmation, attendance recording, notifications,

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certificate approvals, certificate access, club information and chatbot interaction. The study does not provide numerical accuracy, response-time or user-satisfaction metrics because the project's materials do not include such data.

10. RESULTS AND DISCUSSION

The proposed CampusHub Smart AI is a prototype, which integrates the majority of the described in the abstract event-related functions. In particular, for the students, the application represents a single source for discovering, registering attending, receiving notifications about events, clubs, and certificates. For the administrators, the events, clubs, attendance, notifications, and certificates management functions comprise the key features of the tool. Thus, the primary value of the invention lies in the integration of the described functions rather than a specific event management tool. Indeed, the existing solutions were found in the course of the research, which covers distinct aspects of the event management process, including registration, QR-based attendance, issuing of certificates, and educational chatbots. Nevertheless, CampusHub Smart AI unifies these functions within the frame of a college event management system, while establishing connections between the events, attendance, and certificate issuing, and implementing the AI assistant, which offers the dialogue-based interaction paradigm. The limitation of the current research is represented by the absence of the comparative analysis and quantitative performance assessment. In other words, besides concluding on the presence of the key features, which integrate the event management process, the current paper does not make claims on the superiority of the developed solution.

11. COMPARISON WITH RELATED WORK

Capability	Typical related work	CampusHub	Integration
Event creation/registration	Common in event systems	Included	Yes
Notifications	Studied separately or with event systems	Included	Linked to platform
Attendance	Often standalone	Included	Linked to participation
Certificates	Often separate verification systems	Included	Linked to approval/attendance
AI assistant	Often FAQ/information support	Included	Event-focused
Clubs	Limited coverage in reviewed set	Included	Part of same portal
Event recommendation	Existing research, mostly separate	Future work	Not currently claimed

12. BENEFITS AND LIMITATIONS

Benefits: unified design decreases extra work between multiple event-related processes; role-based dashboards offer focused access to functions within the dashboard; attendance and certificate approval create a continuous participation workflow; responsive interface allows accessing the dashboard in desktop and mobile browsers; eventfocused assistant provides another information channel.

Limitations: the current study does not provide quantitative benchmark against the existing platforms; the literature survey is not comprehensive and there are ten records to check; event recommendation is not included in the current module set.

The effectiveness of the chatbot should be evaluated with real users and representative event information

13. FUTURE WORK

Further development of the project could include the enhancement of CampusHub with a feature that would recommend events based on the students' interests and participation history, addressing the issue of privacy and evaluation. In addition, further research could be conducted to test the chatbot on the most frequent student inquiries, analyzing the satisfaction rate and the accuracy of responses, and conducting a usability test to determine the most suitable devices for its usage. Moreover, the software could be subjected to user trials among a broader population of students and multiple departments, providing more substantial statistical data on its effectiveness and performance.

14. CONCLUSION

CampusHub Smart AI is a web-based solution that unifies event discovery, registration, attendance, notifications, clubs, and certificate approval in a role-based environment. The reviewed literature provides evidence that each of the aforementioned has been explored extensively as an independent application or research topic. However, little to no information was found on a dynamic event-based role-playing platform that binds the life cycle of an event together with an integrated AI-based student assistant. The proposed solution takes advantage of React, Vite, and Node.js with Express.js and MySQL as the main framework and backend database to achieve the intended goals, with responsive design at its core. The conducted research proves the concept, but further quantitative analysis and additional intelligence-enhanced solutions should be considered to improve the quality of the research.

15. RESEARCH ETHICS AND AI USE

All literature claims in this paper should be cross-referenced from their original publication prior to final submission, especially the records flagged for confirmation in the survey. No performance values are invented in this manuscript. AI tools may be helpful for linguistic improvements and structural optimizations, but references, technical claims, system results and project details should be verified by the authors prior to submission. The conference guidance also stresses avoiding fabricated data, manipulated results and false references.

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