

Transforming Event Management: A Cloud Computing Framework for Scalable and Efficient Solution

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Abstract

Increased intricacy in event management has resulted in problems related to scalability, efficiency, and cost containment. This paper proposes a cloud event management framework model that focuses on operational, resource management, and event management processes. The cloud event management architecture is based on cloud computing integrated with telecommunication, Artificial Intelligence (AI), and Machine Learning (ML) for enhanced decision making through predictive analytics and dynamic control. The modular approach facilitates integration with other data processing systems and enhances operational versatility by interfacing with multiple third-party applications. Emphasis is placed on data privacy and compliance with recognized security standards which preserves and protects the information. Comparison analyses with other event management systems show significant progress in scalability, satisfaction of users, and effectiveness of business operations. This study integrates the development of artificial intelligence (AI) and cloud technology to shift the paradigm of event management from conventional to more agile technological based approaches. Also, the model enables the examination of future hybrid and wholly virtual events that may be further improved by complex event processing and optimization methodologies that operate in real time.

Keywords: Artificial intelligence; Cloud computing; Event management; Machine learning; Resource optimization.

1. Introduction

Recent advancements in technology has greatly impacted the event management industry by incorporating modern techniques into older processes using Event Management Systems (EMS). These systems are critical in enhancing the effectiveness of planning, organization, and implementation activities by monitoring processes in real time and managing resources efficiently (Ekanayake et al., 2010; Fang et al., 2016). The shift towards virtual and hybrid events, that are less reliant on physical locations and cost effective, has been made possible through the use of Cloud Computing (Saad, 2019; Chavan et al., 2024). Cloud based EMS platforms have improved audience engagement and interaction with the system while allowing for increased operational flexibility and scalability (Pansare et al., 2024). EMS

functionalities are also being enhanced by Artificial Intelligence (AI) and Machine Learning (ML). AI powered tools offer predictive insights which aid in making real-time decisions, managing resources, and customizing interactions during the attendance (Jadhav et al., 2023; Kavitha, 2023). Security and promptly responsive measures have been advanced by AI chatbots and intelligent surveillance systems that ensure immediate action is taken toward solving participants requests and spotting associated risks (Accelevents, 2025; Event Decision, 2025). This study aims to develop an event management system that is modular, fully cloud based, and AI as well as ML integrated in order to address the current challenges in scalability, security, and efficiency [1-4]. The contribution to originality here is in

constructing a robust model capable of meeting the market's constant changing needs for hybrid and virtual events, which encourages the modernization of EMS systems through technology (Chavan et al., 2024).

2. Method

The proposed cloud-based event management system is designed to address inefficiencies in traditional event planning and execution by leveraging cloud computing, artificial intelligence (AI), and machine learning (ML). This system enhances scalability, productivity, participation, and security while offering a dynamic and environmentally friendly approach to managing physical, virtual, and hybrid events.

2.1 System Architecture

The system follows a modular architecture, ensuring seamless integration with external systems and third-party services. This flexibility allows the platform to accommodate various event types efficiently.

- **Event Planning and Scheduling Module:** This module provides organizers with a suite of tools for event creation, updating, and scheduling, with real-time modification capabilities. AI-driven analytics assess historical event data and user preferences to suggest optimal scheduling and resource allocation. Additionally, AI features mitigate scheduling conflicts, enhancing event efficiency and execution [6].
- **Virtual Event Hosting:** The cloud infrastructure supports advanced functionalities, including live streaming, webinars, and virtual booths. Integrated real-time analytics track user participation and engagement, providing valuable insights. These features ensure a seamless virtual experience for remote attendees, maximizing engagement and interaction.
- **Predictive Analytics Module:** Utilizing ML algorithms, this module analyzes attendee data to optimize event experience. It predicts user preferences, recommends seating arrangements, and personalizes event offerings, thereby improving attendee satisfaction and overall event success.
- **Communication and Notification System:** This module automates communication

workflows through email campaigns, push notifications, and reminders. AI-powered chatbots enable real-time interaction during live Q&A sessions, enhancing attendee engagement and ensuring continuous information flow throughout the event [5].

2.2 System Workflow

The system follows a structured workflow, as illustrated in Figure 1, with the following key components:

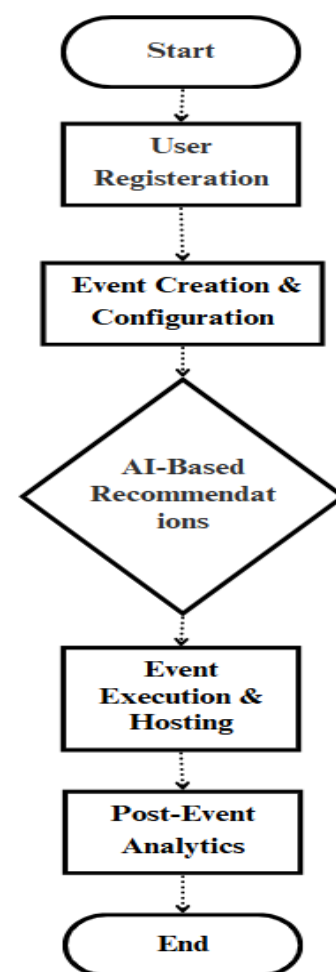


Figure 1 Structured Workflow

- **User Registration and Login:** Once the platform is provisioned for an event, users, including organizers and participants, must register and authenticate. Robust authentication mechanisms safeguard data and access control.
- **Event Creation and Configuration:** Organizers define event settings, specifying

whether the event is physical, virtual, or hybrid. They can configure various modules such as registration, ticketing, and virtual hosting to meet diverse event requirements.

- **AI-Driven Optimization:** Once event details are set, AI-driven analytics determine crucial parameters such as venue, resources, and session timings. This optimization maximizes efficiency and resource utilization.
- **Event Execution:** During the event, the platform supports live streaming, interactive engagement features (e.g., Q&A sessions), and real-time updates. These elements contribute to a dynamic and immersive attendee experience.
- **Post-Event Analysis:** Advanced features, including attendee feedback collection, voting mechanisms, and interactive dashboards, enhance engagement and foster collaboration among participants. These analytics provide valuable insights for future event improvements.

3. Results and Discussion

3.1 Results

The event management system located on the cloud modifies cloud computing to Scalability, Productivity, Participation, Security, and Event Management Integration. Its modular form allows easy modifications for third party services for physical, virtual, or hybrid events. Key modules are Event Planning and Scheduling which optimizes event timelines and resource allocation and Virtual Event Hosting supporting live events, webinars, and analytics. Attendee experience is enhanced with Predictive Analytics Module, and notifications are automated for AI Communication System interaction. User registration is followed by event configuration, AI optimization, execution with interactive multimedia functions, and post event analysis. Advanced security, engagement moderation, and automation offers a modernized system in event management and improves satisfaction and efficiency of attendance.

3.2 Discussion

The cloud event management system transforms the planning of an event with an outstanding integration of cloud computing, structural modularity, and the use of AI analytics. This greatly increases

automation, scalability, efficiency, and security of the system. The integration of third-party services is seamless making it flexible for virtual, physical, and hybrid events. The AI-driven analytics enables resource scheduling, attendee engagement, and involvement without time constraints [8]. Real-time communication is further enhanced through automation with chat bots, increasing engagement. Leading computer security defenses also protect data, which is one of the most critical components for digital event management. Even though some initial funding along with skilled personnel may be required for implementation of the platform, Increased effectiveness and participatory engagement justifies the expenses. Future research should consider deepening AI-enabled personalization as well as increasing system interoperability.

Conclusion

This research has established that problems in meeting management, such as inefficiencies, lack of personalization, and data integration hurdles, can be solved with the application of AI, ML, and cloud-based solutions. The results and discussions clearly elaborate on the ways these technologies enhance event management and improve attendees' satisfaction using real-time analytics and customization. Cloud technology not only facilitates the optimization of event planning and execution, but also illustrates the great need for strong data protection mechanisms to avert breaches. Furthermore, as the world moves towards virtual and hybrid events, adopting revolutionary approaches to technology becomes mandatory in order to satisfy a growing and more diverse audience. It is clear that automation and cloud technology will continue to transform the event management landscape to make processes more efficient, engaging, and environmentally friendly [9-11].

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