



# QR -Based Event Management System with an Attendance Tracking System

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**Abstract:** Managing events in educational institutions and organizations involves a vast number of participants in events, which produces large datasets to be maintained and stored. Organizing events involves class-to-class announcements, manual registrations, paper ticketing, gathering and maintaining attendance records, collecting feedback, certificates issuing and storing events details which are being conducted. Managing above activities requires more human effort and time also prone to human errors while storing this vast data. This project presents a web-based solution which helps to digitalize and efficiently manage all activities of events. We provide a centralized platform which consists Event dashboard to display events, make Digital Registrations for events, Digital QR tickets, Attendance Tracking Dashboard, Digital Feedback collection, Winner Announcements, Automated Certificate Generation for attendees and an efficient data storage to maintain event records useful for future purpose. For the development of applications, we are using HTML, CSS, ReactJS as front end, Spring Boot Frame-work and Core Java for Backend connectivity [11], and a MySQL relational database for data storage.

## I. INTRODUCTION

Events organized in colleges and universities are handled by a group of members (coordinators). They are responsible for handling registrations, presenting information related to events, controlling access to events and keeping track of participants' attendance, giving certificates for event attended students and also takes feedback for the event manually. Managing these activities manually will not be efficient. In the existing system, event coordinators make use of large amount of paperwork in the registration process, while presenting information and tickets issued for events. Even if they use existing spreadsheets their usage will not be efficient as they are prone to human errors, duplications and not secure storage. With increase in growth of web technologies, it can be used to build an automated system to manage events efficiently. A web-based event management system usage will reduce manual registrations, make it easier to access events and participants data [15].

Automated registrations, QR-Ticket Generations, Attendance tracking, Digital Feedback and Digital Certifications helps event coordinators organize events more effectively. Hence, adopting a digital solution helps to overcome drawbacks of manual event managing systems.

Our project provides a web-based event registration and attendance tracking system that helps to simplify event management activities in educational institutions and organizations. The application provides an online platform for event coordinators to manage registrations, share information about events, issue digital tickets and track attendance of event participants efficiently. To make a faster and secure system we incorporate QR based ticketing, which enables quick verification and automated attendance validation during events. The proposed system aims to reduce human work, reduce errors, and improve efficiency in events management.

## II. LITERATURE REVIEW

Event management in educational institutions has evolved from traditional manual methods such as paper forms and spread sheets toward comprehensive digital solutions that include registrations, ticket generations and participant



management. Digital systems began to appear to address these limitations by offering basic online registration and database management features, which reduced paperwork and improved accessibility for event organizers and participants.

Several research studies mainly focus on event creations, dashboard, replacing manual registrations and saving time. More recent studies explored the use of QR code technology for attendance recording, as QR codes allow faster user identification and automated attendance capture. Research findings indicate that QR-based systems reduce duplication, improve security and improve the efficiency of attendance monitoring. [2,3]

Even with significant progress in the event management system, most existing research focuses on individual elements such as digital registrations or attendance tracking rather than providing a complete integrated solution. There remains a need for systems that combine event creation, online participant registration, QR digital ticket generation, and attendance tracking within a single platform.[4]

This gap makes us present the current study, which aims to develop an event management solution that includes the entire lifecycle of event organization and execution.

### III. METHODOLOGY

The development of the Smart Event Registration and Attendance Tracking Platform includes a module-based approach. Methodology includes system architecture, admin and registration modules, QR ticket generation module, Attendance Tracking module, Security and Data Integrity, Data Evaluation.

#### A. System Architecture

The system makes use of a three-tier architecture comprising of:

*Frontend Layer:* A user web interface developed using HTML, CSS, React JS and JavaScript frameworks to provide user registration, ticket access, and admin dashboards.

*Backend Layer:* A server-side application built using a Spring Boot framework to handle authentication, QR code generation, attendance validation, and data handling and processing.

*Database Layer:* A centralized MySQL relational database used to store participants, event organizers and event details.

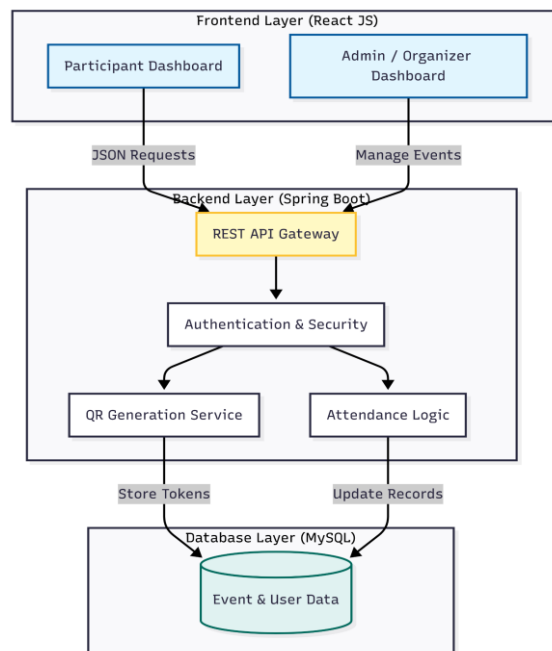


Fig. 1. System Architecture with Layers.



**B. Admin and Registration Module**

The system consists of a front-end interface which has event dashboard, registration or login interfaces provided for Admin and Participant separately. Admin can create events by logging into his account and give complete details for events. For the first time login participant should register into our application by filling a registration form where the participant should provide details like name, email address, passwords and any other required fields given in registration fields provided. Upon a successful registration participant \ admin can login with credentials providence.

**C. QR ticket Generation Module**

To improve security and efficiency on ticket generations we integrated the existing event management system with QR based ticket generation which provides faster and secure management of tickets. Here the system generates a unique participant ID and encodes it into a QR code using a secure hashing mechanism then used as digital ticket sent to participant through email or download from dashboard. Each QR code is unique and this provides faster attendance reporting. [5,7,10]

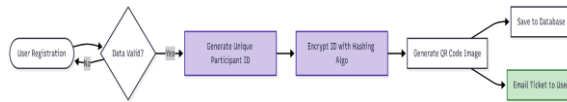


Fig. 2 QR- ticket generation workflow

**D. Attendance Tracking Module**

At the event venue, event coordinators use a web or mobile scanning application to scan participant QR codes. The scanner sends the decoded identifier to the backend server for validation. If the QR code is valid and unused, the system marks the participant as present and records the timestamp. After successful scan then ticket considered as invalid and cannot be used again for fake participations. [6,8,12]

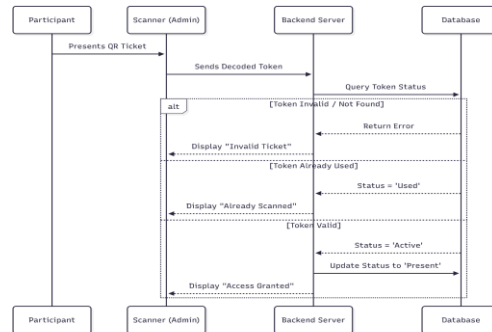


Fig. 3. Attendance Scan and storing workflow

**E. Certificate Generation Module**

After the completion of the event, Students can Download certificate for participation for the event. Certificate contains student details, event-organizer where details are taken automatically after successful registration for the event using servlets. Certificate will only be issued for the participants who attended event only after event organizer has done scan of student QR successfully within event time. Certificate is downloaded as Pdf format which have attracting out view.

**F. Event-Feedback Collection Module**

Event participants can submit feedback for attended events after completion of event. Feedback taken as stars and also a descriptive text to talk about their views and any improvements on event can be specified there. Event Organizer can see average ratings and individual rating given by all event participants [9,10].

**G. Security and Data Integrity**

Security is enforced to the system by separately ensuring authentication for the different logins for both the participants and admin logins. Then for ticket generation we make use of separate participant ID generated and then QR tickets are



generated by encryption of ticket data then verified with a QR scanner by using decryption techniques This ensures one time usage of ticket and removes fraudulent ticket usage [17].

Participant and admin's data is stored in a relational database i.e. MySQL database where we incorporate encapsulation techniques to ensure secure storing and data recruitment while making usage of our system application.

#### H. Evaluation Metrics

The performance of the system is evaluated using several simple metrics. Registration time is used to measure how long a participant takes to complete the event registration process. Ticket-Scan time refers to the time required to scan the QR code and successfully mark attendance. Accuracy describes how correctly the system records attendance without errors or duplicate entries. User feedback is also considered to understand the satisfaction level of participants and coordinators regarding use of overall system efficiency.

### IV. RESULTS

The results of the proposed system show a higher improvement over manual event management method. During testing, participants were able to complete the registration process quickly and without confusion, which helped reduce long waiting queues for entry to the event. The QR code-based check-in process was smooth and fast, allowing participants to enter the venue within a second.[14] Attendance records were accurately maintained, with almost no cases of duplicate or incorrect entries, ensuring a reliable system.

Organizers found the real-time attendance dashboard very helpful, as it allowed them to monitor participant flow and total attendance instantly.[13] Feedback collected from participants and event coordinators indicated high satisfaction, mainly due to the simplicity of the system and the convenience of digital tickets. Overall, the results confirm that the platform provides an efficient, user-friendly, and reliable solution for event registration and attendance tracking.

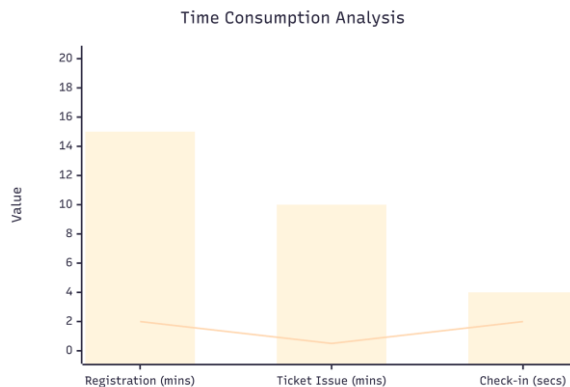


Fig. 4. Graph to show results data.

### V. DISCUSSIONS

The final results obtained from real world implementation of QR based event management system with secure attendance tracking indicates that our given proposal of the solution effectively addresses the drawbacks of traditional event management methods .The outcome shows our system helps in faster registrations , easier events data access , faster check-ins into events, reduces delays at entry points of events , Digital QR tickets reduces paper works and simplifies attendance storage in a secure and efficient way.

The system also provides high accuracy in the maintenance of attendance records, which reduce errors and duplications are removed. Event coordinators get benefited by real time attendance monitoring so helps for faster decision making. Participants responses are positive as digital tickets are easier to access and carry on.



The system relies on stable internet connectivity and requires a mobile scanner at an event to carry out the verification of tickets. Which may pose some challenges on certain constraints. Finally, the discussion confirms that the proposed application is a usable, reliable, and practical solution for managing events in educational, corporate, and public settings, with scope for further enhancement through offline support and mobile application integration.

## VI. CONCLUSION

This paper presents a smart event registration, QR based event management system with secure attendance tracking which practically can be used to automate and manage the event processes easier and efficiently. By integration of online registration with secure QR code-based ticketing makes instant and secure attendance verification. The experiment results describe faster registrations and check-ins. High accurate storage of participants records [16] and got positive response for feedback taken from both event participants and organizers / coordinators.

The result system offers a low cost and feasible solution which suits academic colleges to organize their college fests, farewells, conferences and workshops in an efficient way. While the current working of the system depends on internet connectivity for real time operations, it provides a strong foundation for future improvements.

Potential improvements include offline QR validation, online support and can be integrated with payment or learning management systems. Overall, the proposed system contributes a practical and reliable approach to current time digital event management.

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