



## Smart Hostel Attendance Management System Using QR and Biometric Authentication

<sup>1</sup>P. A. Tamgave, <sup>2</sup>Priya Pujari, <sup>3</sup>Siddhi Gaikwad, <sup>4</sup>Vinamr Naik, <sup>5</sup>Neha Kurne

<sup>1,2,3,4,5</sup> Information Technology, Dr. J. J. Magdum College of Engineering, Jaysingpur, Shivaji University Kolhapur, Maharashtra, India.

Peer Review Information	Abstract
<p><i>Submission: 18 April 2026</i></p> <p><i>Revision: 09 May 2026</i></p> <p><i>Acceptance: 26 May 2026</i></p> <p><b>Keywords</b></p> <p><i>Hostel Attendance, Android Application, Firebase, QR Code, RFID, Fingerprint Authentication, Real-Time Monitoring</i></p>	<p>The Hostel Daily Attendance Application is developed to improve the efficiency and reliability of attendance management in hostel environments. Traditional methods based on manual record-keeping are often time-consuming and prone to errors. This system introduces a digital solution using an Android application integrated with Firebase Realtime Database to provide real-time attendance tracking. It incorporates technologies such as QR code scanning, RFID, and fingerprint authentication to ensure secure and accurate verification. The system enables wardens to monitor attendance, manage student records, and send alerts to parents. The overall implementation reduces administrative workload, improves transparency, and enhances student safety.</p>

### Introduction

In many hostel environments, attendance is still managed using manual registers, which leads to several challenges such as inaccurate data, time delays, and lack of transparency. These traditional methods do not provide real-time monitoring and are also vulnerable to issues like proxy attendance and missing records.

The Hostel Daily Attendance Application is designed to overcome these limitations by introducing a digital and automated system. It allows students to mark attendance using secure methods such as QR codes, RFID, and fingerprint authentication. These methods ensure that only the actual student can mark attendance, improving system reliability.

The application provides separate modules for students and wardens. Students can mark attendance and view their records, while wardens can manage data, generate reports, and

monitor activities in real time. Additionally, the system improves safety by sending alerts to parents in case of absence or irregularities.

### Methodology

The system is designed as a mobile-based application supported by a backend database. It consists of two main modules: the Student Module and the Warden Module.

#### 1. System Design

The application is developed using Android (Java) and connected to Firebase Realtime Database. Each student is assigned a unique identity, and their attendance records are stored and managed in real time.

#### 2. Student Module

The student module provides the following features:

- Mark attendance using fingerprint authentication, QR code, or RFID

- View personal attendance records
- Submit leave requests
- Receive notifications regarding attendance status

### 3. Warden Module

The warden module acts as an administrative panel:

- Manage student and hostel data
- Approve or reject leave requests
- Monitor attendance in real time
- Generate attendance reports (daily, weekly, monthly)
- Send alerts to parents

### 4. Data Processing

#### Modeling And Analysis

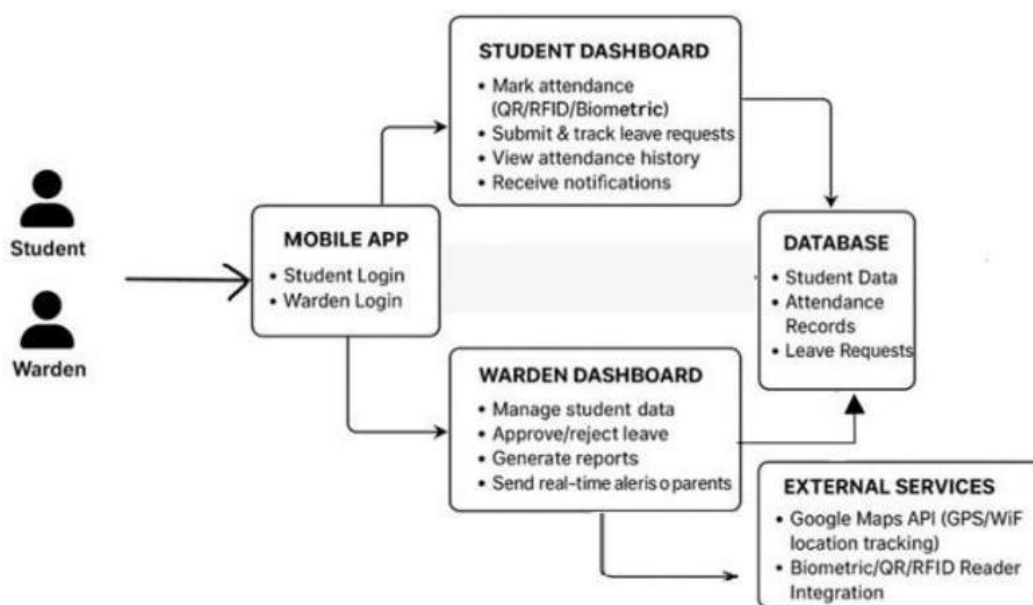


Fig 1: System Architecture

#### Results And Discussion

The graphical user interface (GUI) of the proposed campus club platform is designed to provide a simple, user-friendly, and interactive experience for both students and coordinators. The interface focuses on easy navigation and clear presentation of information to improve overall usability.

Fig. 1 Admin Dashboard Screen :Central control panel for admins to set warden location and manage daily attendance codes.Includes options to update time schedules and synchronize attendance data efficiently.

Fig. 2 Admin Panel Screen:Allows the admin to manage attendance by setting location, generating codes, and defining time slots.Provides quick actions like changing/sharing codes and tracking attendance status

Fig. 3 Student Dashboard Screen:Allows

When a student marks attendance, the system records details such as student ID, timestamp, and verification method. This data is stored in Firebase, ensuring real-time updates and secure storage. The system avoids duplicate or false entries through proper authentication.

### 5. System Integration

The system integrates QR codes, RFID, and fingerprint authentication to provide a reliable and secure attendance mechanism. Fingerprint authentication plays a key role in preventing proxy attendance and improving overall system accuracy.

students to mark attendance using a daily code and biometric verification.Provides options to submit leave requests and view attendance-related actions easily.

Fig.4 Admin Reports Screen:Displays key analytics like total students, pending requests, and approved leaves.Enables report generation, CSV export, and management of leave requests.

Fig.5 Attendance Report Screen: The student attendance shows daily records along with weekly and monthly absence summaries.

Fig.6 Comparison Chart: The chart shows improvement in attendance system accuracy from 55% in manual systems (2018) to 95% in the proposed smart system (2024). Accuracy increases with technology upgrades like RFID, biometric, and IoT, and the final system achieves the highest accuracy using AI, IoT, and cloud integration, reducing errors and improving efficiency.

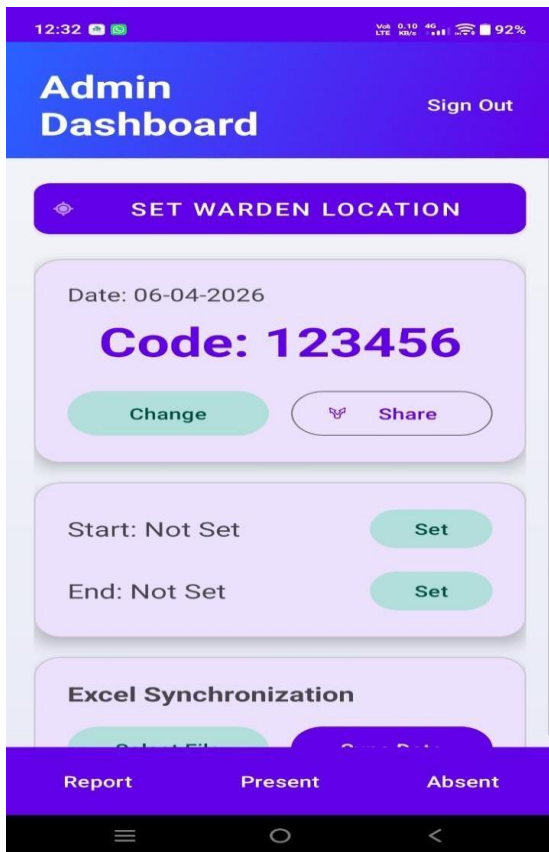


Fig 2: Admin Dashboard

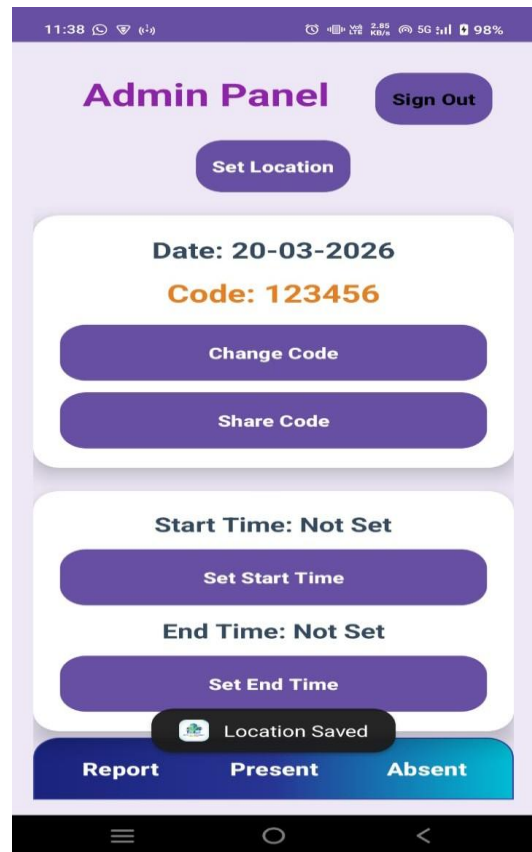


Fig 3: Admin Panel

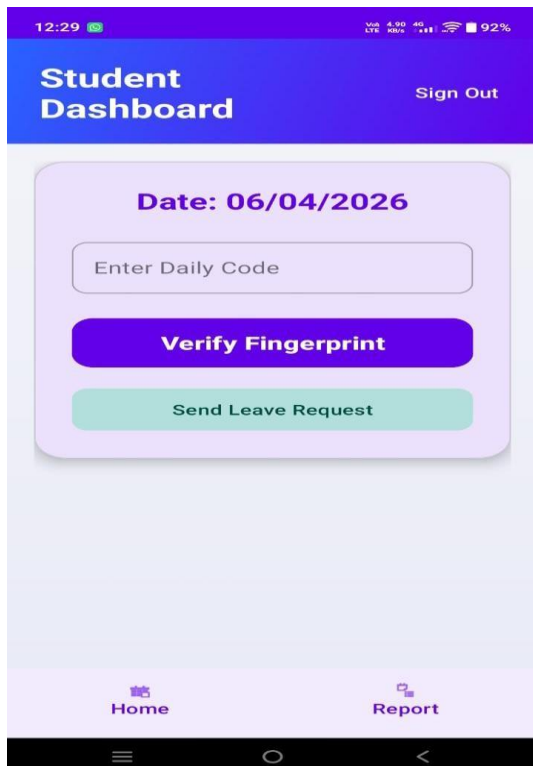


Fig 4: Student Dashboard

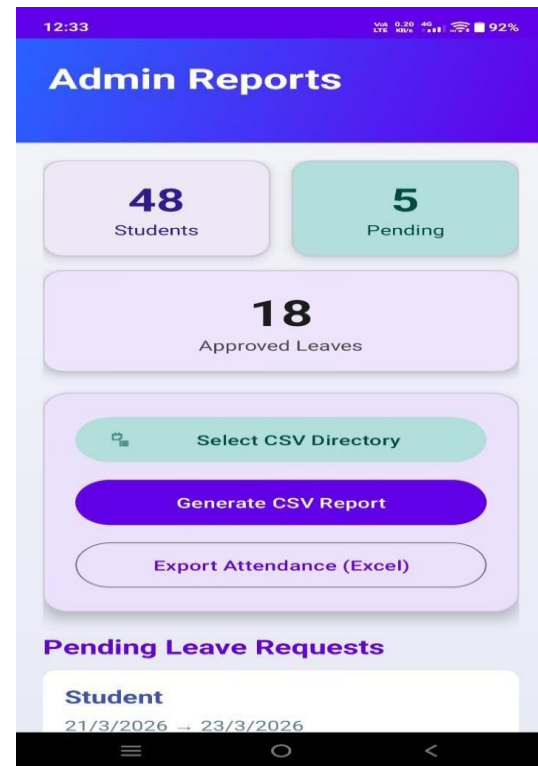


Fig 5: Admin Report

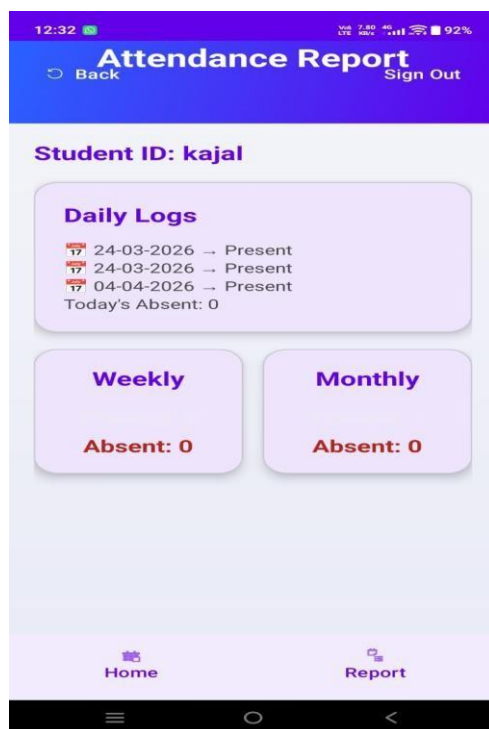


Fig 6: Attendance Report

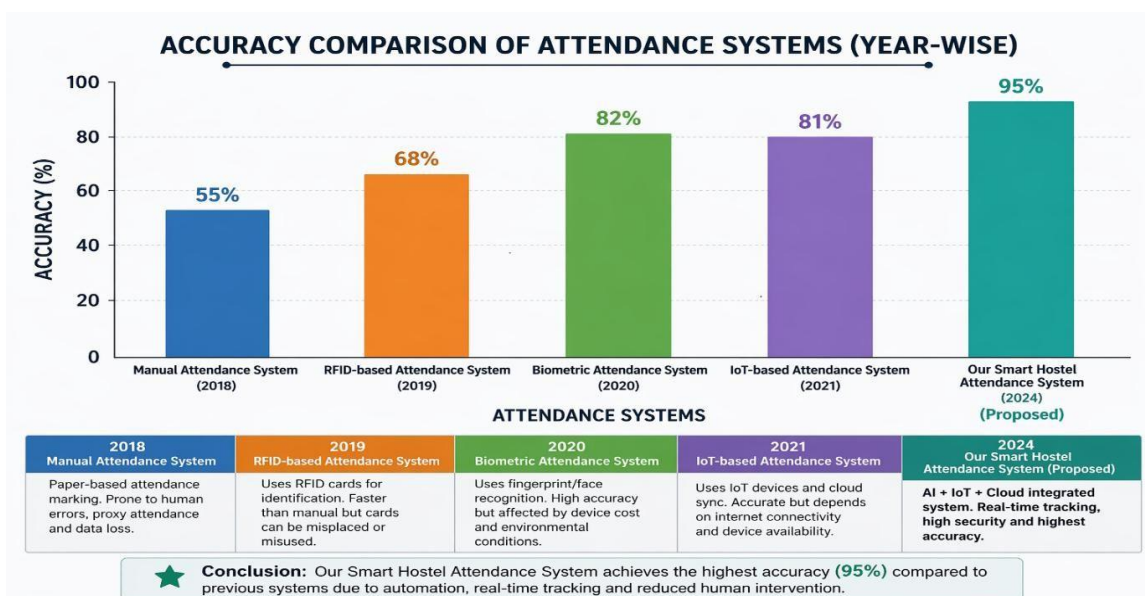


Fig 7: Comparison Chart

**Conclusion**

The Hostel Daily Attendance Application successfully replaces traditional attendance methods with a modern digital system. By using technologies like QR code, RFID, and fingerprint authentication, the system ensures accurate, secure, and real-time attendance tracking. It reduces manual work, improves transparency, and enhances student safety. Overall, the system provides an effective solution for hostel

attendance management.

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