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Mini Project Presentation On
"QR ATTENDANCE SYSTEM"

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Under the Guidance
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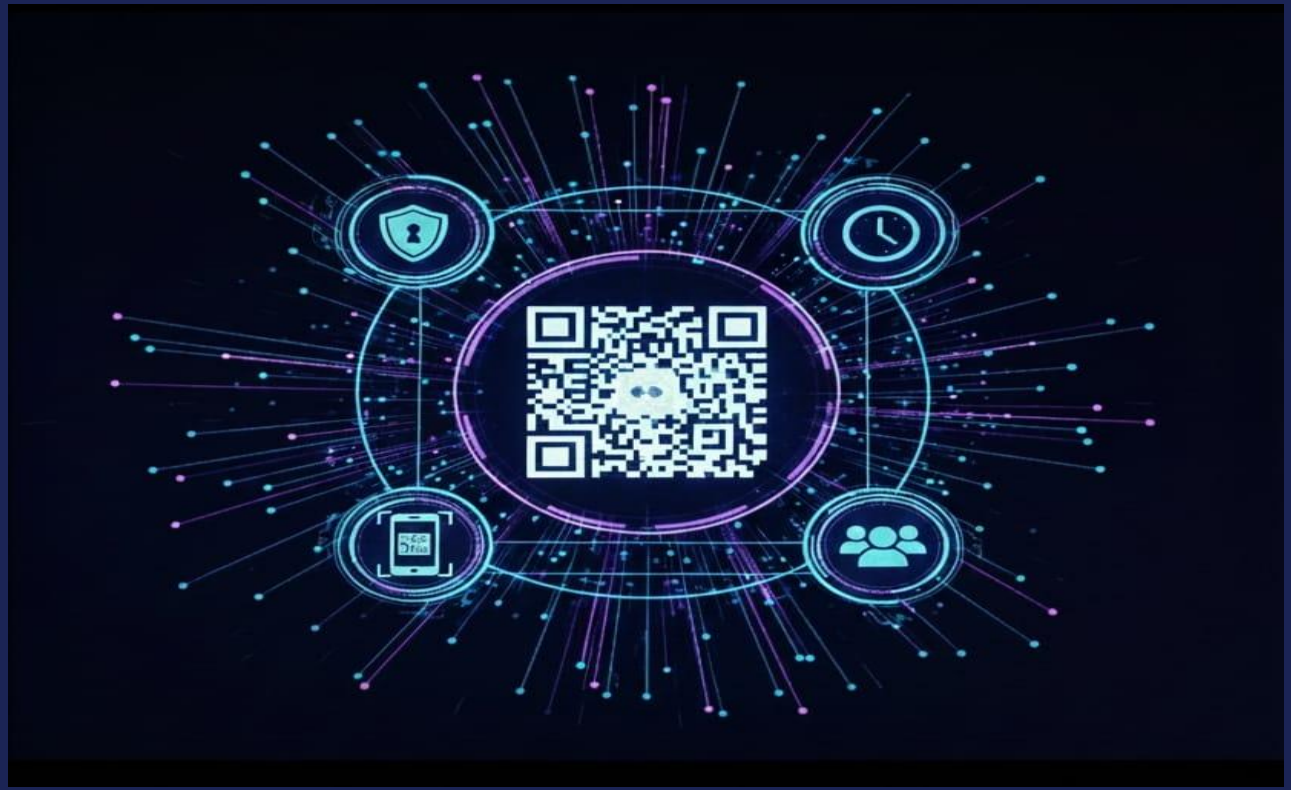
QR CODE ATTENDANCE SYSTEM



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Problem Statement

The primary objective of the QR Code Based Student Attendance System is to provide an efficient, accurate, and paperless solution for managing class attendance. It is designed to automate the recording process, enhance data integrity, and provide immediate reporting capabilities.

“**To design and implement a QR code-based attendance system that instantly digitize attendance data using mobile scanning technology**”.

Scope of the Project

Key Area the Project Focuses On

•QR code generation : creating unique codes for every session.

•Real –time database synchronization: instantly recording attendance

•Core Functionalities:

- Generating unique attendance QR codes for specific sessions
- Scanning and validating users ID against the QR code
- Generating attendance reports

Expected Impact or Benefits

- **Efficiency :** saves times by automating the attendance process.
- **Accuracy :** eliminates manual errors and buddy – punching

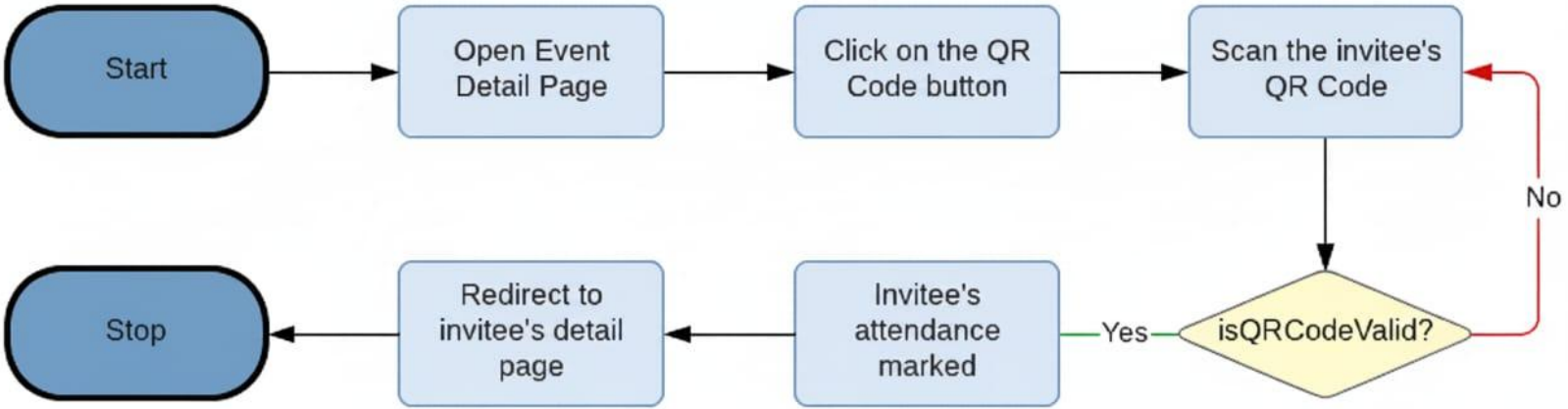
Project Design

Hardware: A computer for the server/admin panel, and a smartphone for users check-in

Software Components

- **Frontend**:
  - HTML, CSS, JavaScript for user interaction
- **Backend**:
  - Python for handling requests and data processing.
- **Core Libraries**:
  - **QR code generation ;** Qr code
  - **Scanning/decoding** ; a client –side JavaScript library

Block Diagram



Methodology

1. **Requirement Analysis**:
    - Defined secure QR code requirements, database schema, and report formats.
    - QR Code Core Implementation Developed the logic for
2. **Frontend Development**:
    - Created responsive web interfaces for scanning and management.
3. **Backend Development**:
    - Built a Python/Flask API to handle code validation and database operations.

Tools and Technologies Used

1. Frontend Tools:

- **HTML/CSS:** (Interface and Scanner Logic)
- **JavaScript**: For real-time interaction.

2. Backend Tools:

- **Flask Framework**: For building and managing API application

3. Technologies and Libraries:

- **QR Code:** qrcode (Python).
- **Database**: SQL (for DB connection)
- **Scanning:** jsQR (JavaScript)
- **Security:** Libraries for JWT/Encryption (for code integrity)

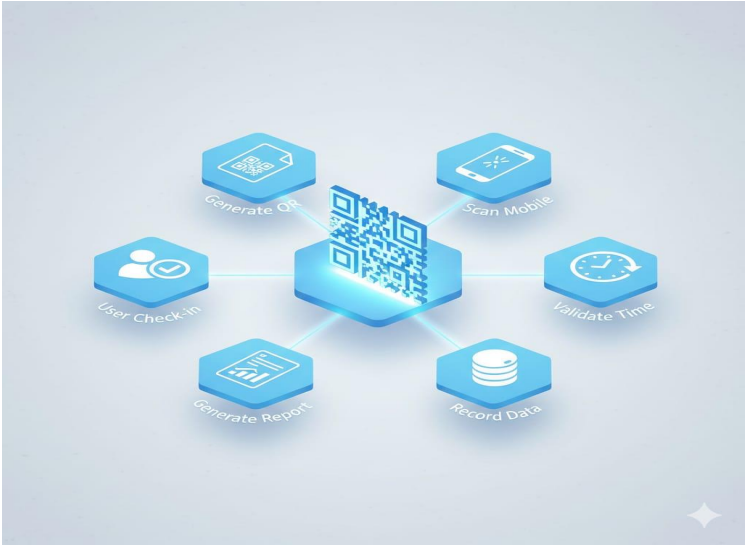
Implementation

1. Preparation (The Setup):
- The Code Generator
- The Database

2. Marking Attendance (The Scan)
- Display
- Scanning
- Data Capture

3. Record Keeping (The Logging)
- Server Processing
- Log the Entry

4. Reporting (The Result)
- Viewing Records



Challenges Faced

QR Code Security & Expiration:

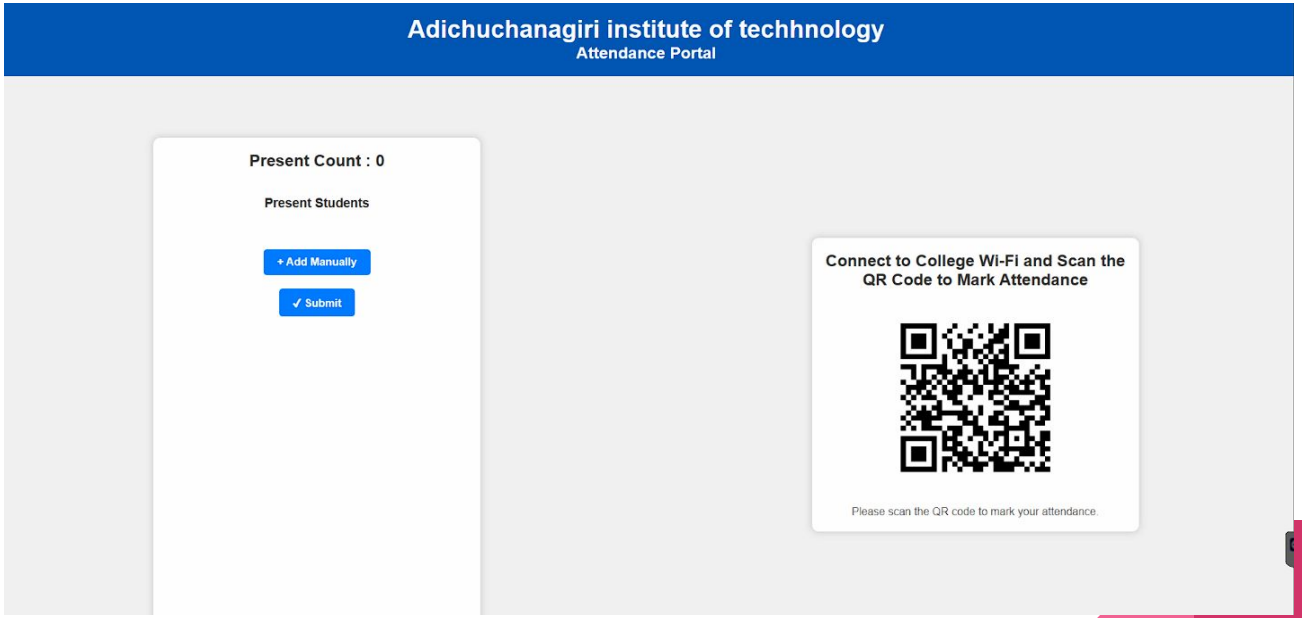
- Issue: Preventing users from sharing or screenshotting the code to check-in remotely.
- Resolution: Implemented time-based tokens within the QR code data to ensure they expire quickly and are valid only for the current session.

Scanning Consistency:

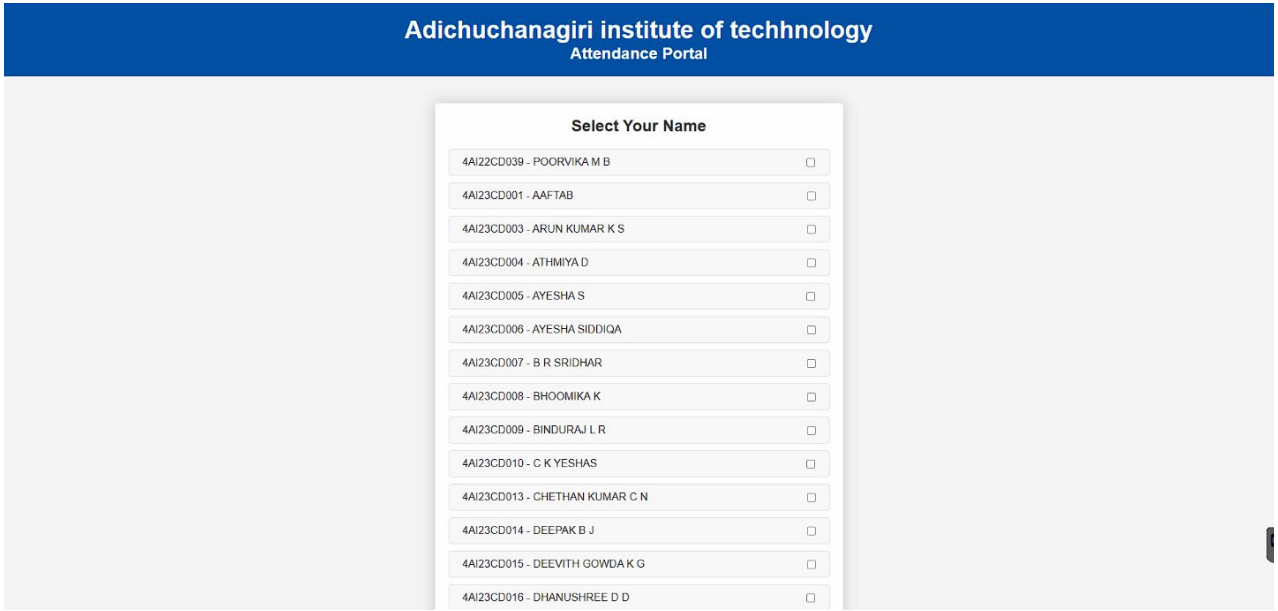
- Issue: Ensuring the scanning app works accurately under various lighting conditions and phone models
- Resolution: Optimized camera settings and used a highly robust client-side scanning library.

Result

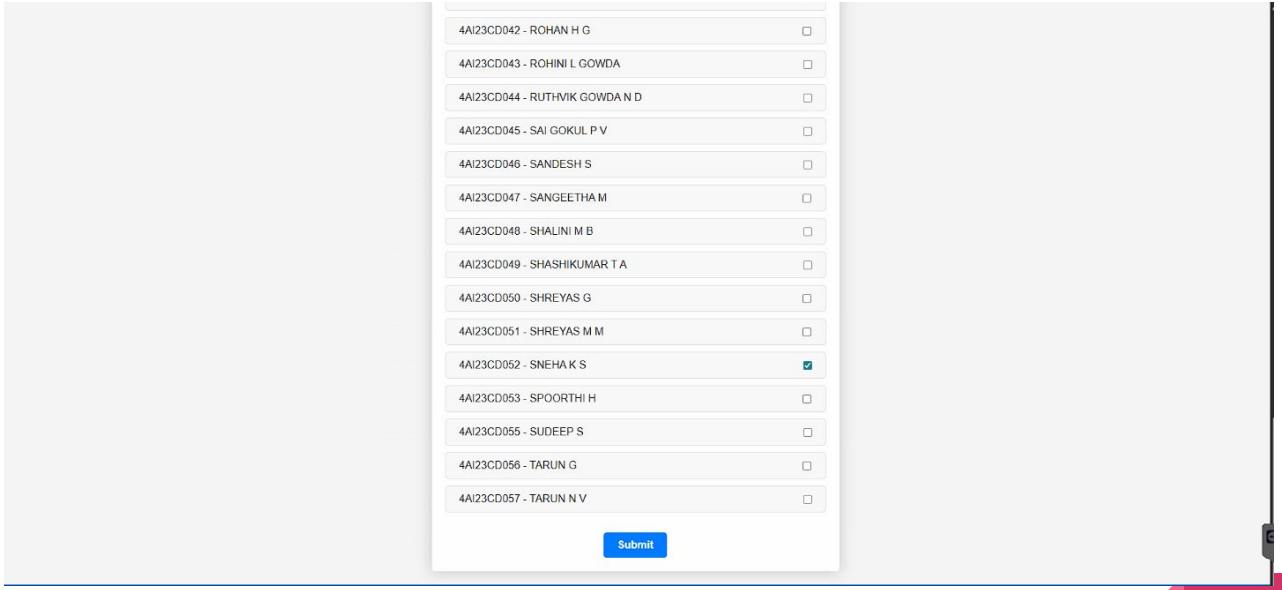
1. **Faculty dashboard**:



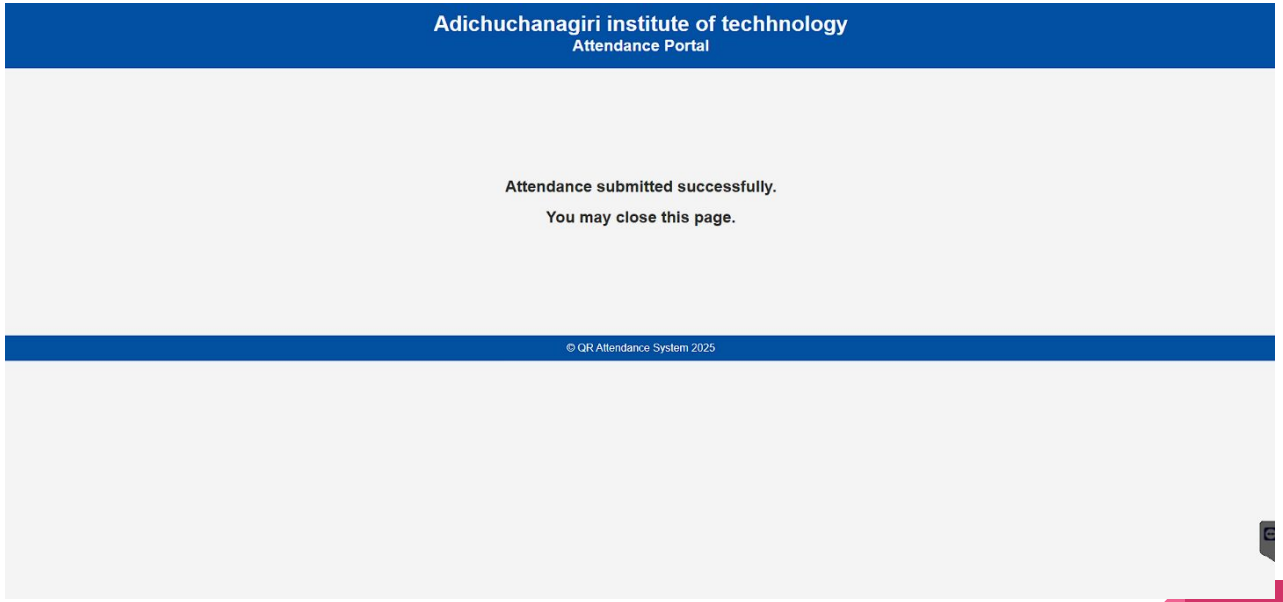
2. Student app



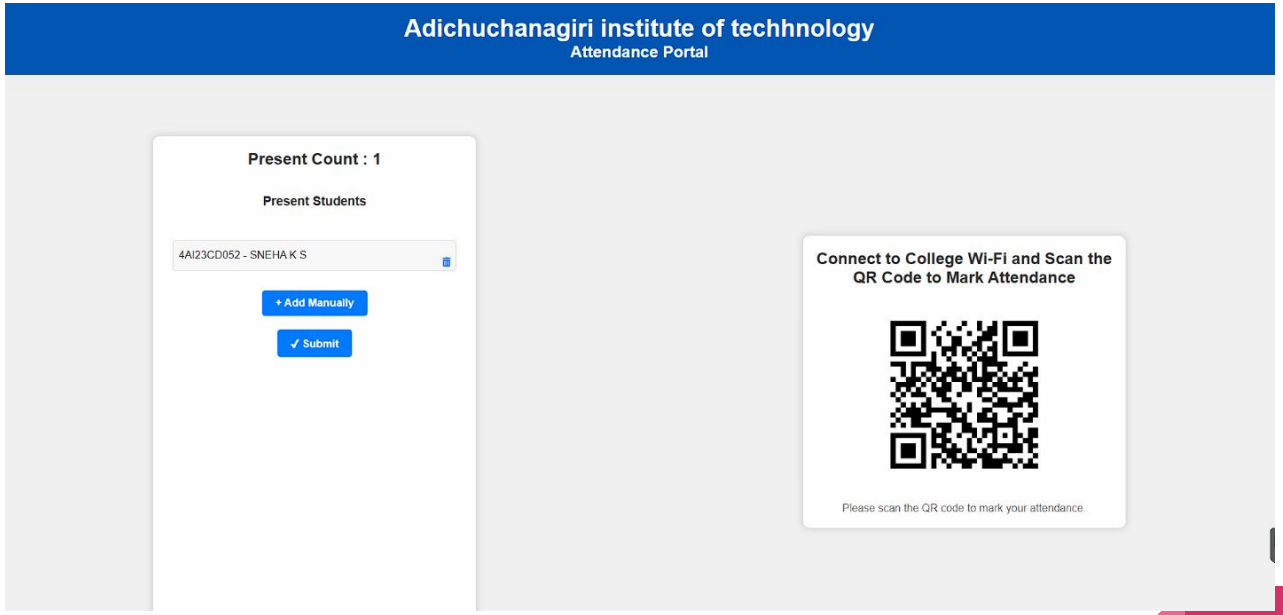
3. real-time attendance confirmation



5. Attendance confirmation:



4. View attendance report:



Conclusion

The QR Attendance System successfully automates and simplifies the process of attendance tracking using secure, time-sensitive QR codes.

It delivers an efficient and user-friendly experience by eliminating manual sign-in and providing real-time data to administrators.

This project demonstrates the advantages of using modern mobile technology to enhance operational efficiency and data integrity.

Future Work

- Geofencing/Location Check: Integrate GPS verification to ensure users are within a specified physical location before the scan is validated.
- Integration with HR/Student Systems: Connect the database directly to existing institutional management systems (e.g., student portals or payroll).
- Biometric Fallback: Add an optional face recognition or fingerprint scan as a secondary authentication method.

GitHub Link

- https://github.com/sneha-ks27

Thank You