

Problem Identification & Stakeholder Analysis

Problem statement :

With our current **Attendance taking procedure for Teachers and Attendance tracking procedure for students**, students and faculty members face challenges in efficiently managing attendance and tracking academic participation. The traditional attendance methods, such as manual roll calls or paper-based records, are time-consuming, prone to errors, and susceptible to misuse. Additionally, students lack a centralised system to track their attendance records, leading to confusion about their academic standing. Teachers also need to carry the attendance sheets while coming to the class and going from the class and update the attendance of the students regularly.

Stakeholder Identification :

Primary Users:

- **Students:** The main users of the system, responsible for scanning QR codes for attendance and monitoring their attendance records.
 - **Interests:** Easy attendance marking, real-time tracking of attendance history, receiving attendance alerts.
- **Teachers:** The faculty members who conduct classes and generate unique QR codes for attendance verification.
 - **Interests:** Simplified attendance management, preventing proxy attendance, quick attendance reports.

Secondary Users:

- **University Administrators:** They oversee attendance policies, ensure compliance, and generate attendance reports for departments.
 - **Interests:** Enforcing attendance regulations, monitoring trends, and ensuring accurate records for academic requirements.

Stakeholder Interview Link :

https://youtu.be/IOlseELRc7g?si=i8A5jz_zOhBTv6Gt

Interview Questions:

For Students:

1. How do you currently mark your attendance in class?
2. Have you faced issues with proxy attendance or manual errors?
3. How do you currently check your attendance records?
4. Would you prefer an automated system for attendance tracking? Why?
5. What additional features would you like in an attendance tracking system?

For Teachers:

1. How do you currently track student attendance?
2. What are the common challenges you face with attendance management?
3. How do you verify student presence in large classes?
4. Would a QR code-based system simplify attendance marking for you?
5. How would you like attendance reports to be structured?

For University Administrators:

1. How is attendance data currently stored and processed?
2. How frequently do students request attendance reports?
3. What attendance policies must be enforced, and how?

Initial Requirements:

Functional Requirements:

1. **User Authentication:** Secure login for students and teachers with role-based access control.
2. **QR Code Attendance System:**
 - Teachers generate unique session-based QR codes for classes.
 - Students scan QR codes to mark attendance.

- Real-time validation of attendance submissions.
- 3. **Attendance Tracking:**
 - Students can view their attendance records and percentage calculations.
 - Teachers can monitor student attendance trends.
 - Administrators can generate department-wide attendance reports.
- 4. **Automated Alerts:**
 - Notifications for students falling below attendance thresholds.
 - Alerts for missed classes and low attendance warnings.
- 5. **Admin Panel:**
 - Policy enforcement tools.
 - Attendance data management and export functionality.

Non-Functional Requirements:

1. **Usability:** The system should have a simple, intuitive UI for students and teachers.
2. **Scalability:** It should support thousands of users without performance degradation.
3. **Security:**
 - Authentication via OAuth2/JWT.
 - Data encryption for attendance records.
4. **Accessibility:** Compatible with desktop and mobile devices.
5. **Performance:**
 - Attendance marking should be processed within **3 seconds**.
 - The system should maintain **99.9% uptime**.

Specifications:

1. **Attendance Submission:**

- QR code-based validation.
- Geolocation tracking (optional for in-person verification).

2. **Attendance Reports:**

- Students: Detailed breakdown of attended classes.
- Teachers: Downloadable attendance summaries.
- Admin: Advanced reporting with filtering options.

3. **User Dashboard:**

- Students: Personal attendance history and notifications.
- Teachers: Class-wise attendance tracking and QR code generation.
- Admins: Attendance analytics and policy management.