



# *Attendance Tracking System*

ATS

By group 8

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# *Project Proposal*

**Client:** Prof. Amal Khalifa, Purdue University Fort Wayne

**Purpose:** Streamline and simplify attendance management for instructors

**Target Users:** Educators at Purdue University Fort Wayne

## **Problem Statement:**

- Manual attendance tracking is:
  - **Time-consuming**
  - **Prone to errors**
  - **Causes administrative burden**
- Instructors struggle to maintain accurate and transparent attendance records.
- Reduced time for teaching and student engagement.

# *Functional Requirements*

- Instructor authentication and access control.
- Add, edit, and delete semesters and courses.
- Add students manually or import via Excel/CSV files.
- Generate and email QR codes for attendance tracking.
- Mark attendance via student QR code scanning.
- Generate individual and class-level attendance reports.
- Store and manage data securely in Firebase.

# *Non-Functional Requirements*

- Load times under 2 seconds.
- QR code scanning within 1 second.
- Email sent time should be  $\leq 10$  seconds
- Intuitive, user-friendly interface for instructors.
- Secure data with Firebase authentication and encryption.
- Ensure 99.9% uptime for reliable access.

# *Software Design*

**Architecture:** Client-Server Architecture

**Flow:**

- User interacts with the frontend UI.
- Requests are sent to the Firebase backend.
- Attendance data is stored in the realtime database.
- QR-based attendance updates are processed and reflected on the dashboard.

**Component Design:**

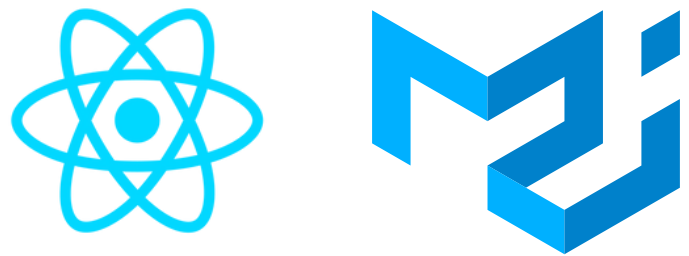
- User Management Module
- Attendance Tracking Module
- Data Management Module
- Report Generation Module
- Dashboard

**Data Model:**

- Users
- Semesters
- Courses
- Students
- AttendanceSummaries

# *Software Design*

## Frontend:



ReactJS + Material UI

## Backend:



Firebase

## Authentication



Firebase Auth

## Emails



Gmail SMTP + Nodemailer

## Storage



Firestore Database

## Hosting



Firebase Hosting

## QR Code



QR code Library

# *Key Features*

## **Semester & Course Management:**

Add, edit, and delete semesters and courses.

## **Student Enrollment:**

Add students manually or via Excel/CSV.

## **Attendance Tracking:**

Email QR codes to students for in-class scanning.

## **Reports:**

Generate attendance reports for individuals or entire classes.

## **Analytics Screen:**

Visualised the monitoring of students' attendance.

# *Software Development*

## **Reusable Components**

- Built reusable components for:
  - Course Management
  - Semester Management
  - Reports
- Benefits: Modularity, maintainability, and reduced code duplication.

## **Authentication**

- Refactored authentication logic for:
  - Clean Code: Applied best practices for secure and modular user management.
  - Efficiency: Removed redundant checks and streamlined workflows.





# *Software Testing*

- **Use Case Testing:**

Defined specific use cases for each page and component to validate functional requirements.

- **Test Case Execution:**

Created and executed detailed test cases for every page and component to ensure reliability and accuracy.

- **Focus Areas:**

Navigation flows, data validation, QR code functionality, email spam filtering and report generation processes.



*DEMO*

<https://attendance-tracking-weba-f327c.web.app>

# *Software Team ( Roles And Responsibilities)*

- **Project Manager - (Divya Navale):** Oversaw the project timelines, coordinates tasks, and ensured milestones.
- **Front-End** - All team members contributed developing user interfaces, implements responsive design, and ensures optimal user experience.
- **Back-End(API)** - All Team members Contributed
- **Testing & Documentation** - All Team members Contributed



# *Software Tools*

## **Development:**

- Code Editor: **VS Code**
- Version Control: **Git** and **GitHub**
- Project Management : **JIRA, Microsoft Teams**



# *Risks vs Solutions*

- **System downtime:**

Use Firebase's high availability and regular backups.

- **Data breaches:**

Secure data with Firebase authentication and database rules.

- **Email delivery issues:**

Implement delivery tracking and retry mechanisms.

- **Performance under load:**

Optimize database queries and ensure Firebase scalability.

- **User input errors:**

Add form validations and error feedback.

- **Attendance proxy (students marking attendance for others):**

Prevent proxy by requiring real-time scanning in the instructor's presence.



# *Project Learning Outcomes*

- Gained hands-on experience in full-stack web development.
- Enhanced skills in requirement analysis and scalable system design.
- Learned project management using JIRA and Microsoft Teams.
- Learned to collaborate effectively in a team using Agile methodology.



# Project Management

Projects / Attendance tracking system 4.0

## Backlog



DN

DA

TT

B

Epic

Type

Insights

View settings

☐

ATS Sprint 1

6 Oct – 20 Oct

(11 issues)

0

0

0

Complete sprint

<input checked="" type="checkbox"/> <del>ATS-1</del> Meeting with Client for Requirement Gathering	DONE	-	DA
<input checked="" type="checkbox"/> <del>ATS-2</del> Run the Application from GitHub	DONE	-	TT
<input checked="" type="checkbox"/> <del>ATS-11</del> Create Working Prototype for requirements	DONE	-	DN
<input type="checkbox"/> <del>ATS-3</del> Develop Detailed Report Feature	DONE	-	DN
<input type="checkbox"/> <del>ATS-4</del> Create Individual Student Report	DONE	-	B
<input type="checkbox"/> <del>ATS-5</del> Implement Absentees Report Feature	DONE	-	DA
<input type="checkbox"/> <del>ATS-6</del> Forgot Password Feature Not Working	DONE	-	TT
<input type="checkbox"/> <del>ATS-7</del> Fix Register Feature	DONE	-	DN
<input type="checkbox"/> <del>ATS-8</del> Revamp UI for Better Usability	DONE	-	DA
<input type="checkbox"/> <del>ATS-9</del> Implement Course Deletion for Professors	DONE	-	B
<input type="checkbox"/> <del>ATS-10</del> Error in Email Authentication while sending QR codes to students & sending Reports	DONE	-	TT

+ Create issue





*Thank you*

