Republic of the Philippines

DAVAO ORIENTAL STATE UNIVERSITY

Guang-guang, Dahican, City of Mati, Davao Oriental

Faculty of Computing, Data Sciences, Engineering and Technology

Information Technology Program

ITC 130 – Applications Development in Emerging Technologies

PROJECT X: Automated Attendance Tracking System: Conceptual Model Diagram
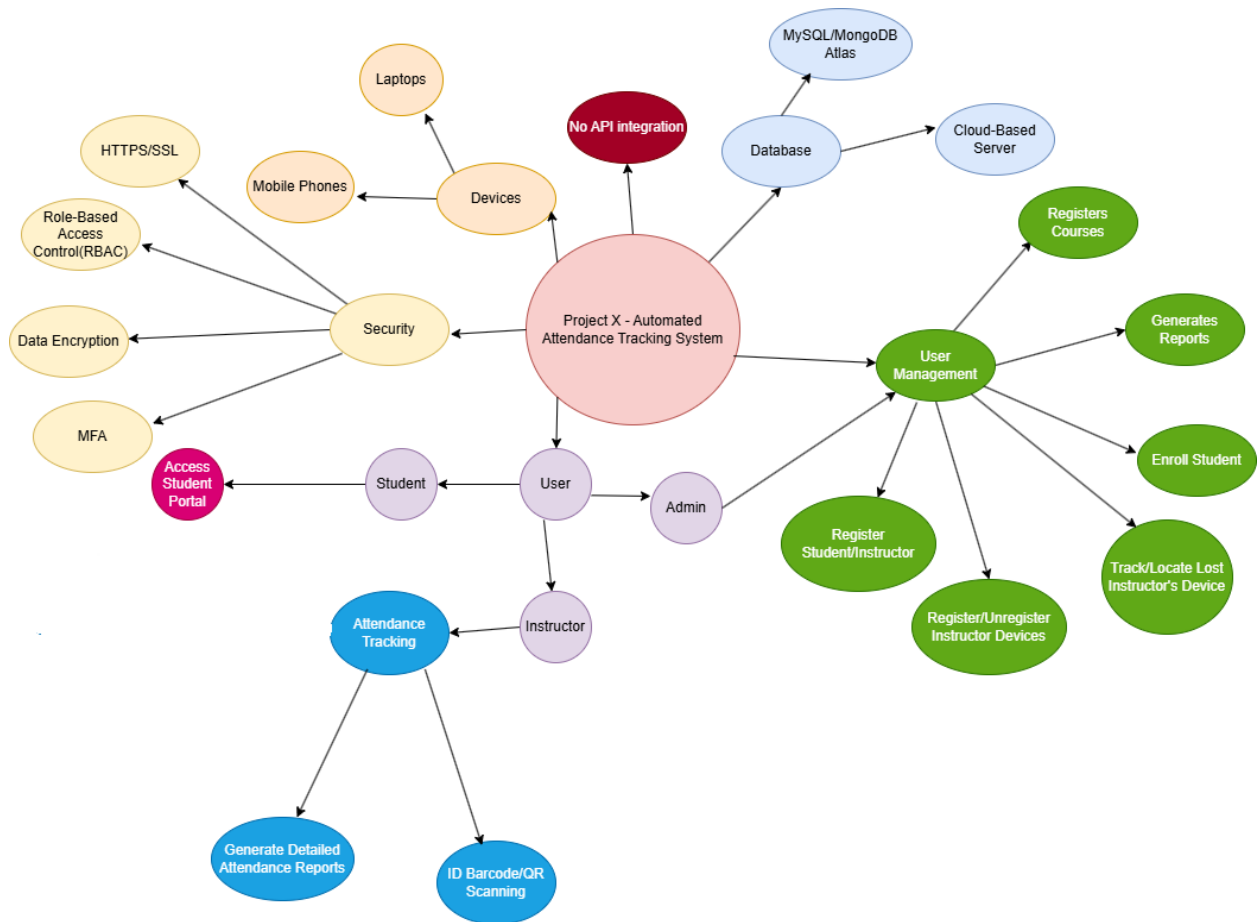
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Conceptual Model

Main System

Project X: Attendance Tracking System

- This serves as the central hub that integrates all functionalities.

- Consider it the "command center" responsible for managing users, attendance data, devices, reports, and other critical operations.

User Roles and Entities

Student

- Every student has a distinct profile containing an ID number, full name, university ID, and a profile image.

- Example: When John Doe (ID: 2023-9001) enters the classroom, he scans a QR code.
- Students use the dedicated portal to check their attendance logs.

Instructor

- Instructors oversee student attendance and capture their photos during sessions.
- They are empowered to:
  - Reschedule or cancel classes when needed.
  - Drop students from the course after three continuous absences.
  - Use approved devices to scan student IDs through QR or barcode.

Admin

- Acts as the system's primary controller.
- They have authority to:
  - Add or remove users (students, instructors), courses, and devices.
  - Assign teaching staff to courses.
  - Locate and manage misplaced instructor devices.
  - Monitor and ensure the system functions as expected.

Key Components

Courses

- Represent academic subjects (e.g., IT101, MATH102).
- Students register for these subjects, and instructors are assigned to teach them.

Attendance Monitoring

- Keeps a real-time log of students' presence or absence.

- Features include:

  - Ability to cancel or postpone classes.

  - Generate summary reports for institutional or parental review.

  - Automatic student removal after three no-shows or absences.

Attendance Tracking/ Logs

- Display essential details such as:

  - Date and timestamp of attendance check-in.

  - Presence status.

  - Connection to the relevant course, student, and instructor.

Devices

- Only authorized devices (e.g., faculty smartphones or tablets) are permitted for use.

- These tools are employed to scan QR codes and document attendance.

- Devices that are lost can be tracked or deregistered for security.

Security Mechanisms

- **HTTPS:** Ensures a secure, encrypted web connection.

- **MFA (Multi-Factor Authentication):** Adds an extra step during login, like entering a code sent via email.

- **RBAC (Role-Based Access Control):** Restricts system capabilities based on user roles (e.g., students can't alter attendance records).

- **Data Encryption:** Safeguards confidential information against unauthorized access or cyber threats.

Backend Infrastructure

Database

- Stores all backend data (students, courses, attendance logs, devices).
- Examples include MySQL or cloud-hosted solutions like MongoDB Atlas.

Cloud-Based Hosting

- The system operates on cloud servers, ensuring remote accessibility and centralized management.
- Data is not limited to a single device or local network.

API Integration: Not Yet Available

- Currently, the system does not support API connections with external platforms or third-party services.

QR Code-Based Attendance (Example Workflow)

1. Student opens the mobile app or online portal.
2. A dynamic QR code is generated, linked to the student's identity, course, and time of attendance.
3. Instructor scans the QR using an authorized device (e.g., phone or tablet).
4. The system logs attendance details instantly, including:

   - Student ID, Course ID, Attendance Status, Date & Time.

Report Generation

- Instructors and Admins can produce various reports such as:

  - Attendance summaries.
  - Patterns in student absences.
  - Course-specific attendance breakdowns.

- These reports support grading, performance monitoring, and administrative decision-making.