

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

Project X

Automated Attendance System

BSIT 3C

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**I. INTRODUCTION**

**1.1 Purpose**

This project proposes the development of Project X, an automated attendance tracking system designed to address the inefficiencies and vulnerabilities of manual attendance recording in academic environments. Traditional paper-based and spreadsheet systems are prone to errors, tampering, and significant time loss.

To solve this, the system uses student-generated QR codes scanned by lecturers via registered devices to securely log attendance data into a cloud-based MongoDB database. It also includes user role control, real-time reporting, and device tracking features for enhanced accuracy and accountability. The system is tailored for Davao Oriental State University (DOrSU), ensuring secure and efficient attendance processes in line with the university's modernization goals.

**1.2 Objectives of the Study**

**General Objective:**

To develop a secure, scalable, and cloud-based attendance system using MongoDB and QR code technology for DOrSU.

**Specific Objectives**:

Enable students to generate QR codes that uniquely identify them per session.

Allow lecturers to scan QR codes using registered devices to log attendance.

Store all attendance records in MongoDB Atlas with proper role-based access.

Provide reporting and tracking capabilities for administrators and lecturers.

Ensure system security through encryption, RBAC, and multi-factor authentication.

**1.3 Scope and Limitations**

**Scope:**

Student registration with ID photo and details.

QR code generation per student.

Lecturer login and device-based QR code scanning.

Attendance logging in MongoDB with timestamp and student-course match.

Admin dashboard for managing users, logs, and reports.

Logs maintained in a secure logging\_logs collection.

Limitations:

Requires a stable internet connection and camera-enabled devices.

QR scanning accuracy may be affected by lighting or camera quality.

No integration with existing university systems (LMS/SIS).

Limited to DOrSU for initial deployment and testing.

Advanced features like biometrics or AI anomaly detection are not yet included.

**V. SYSTEM REQUIREMENTS**

**2.1 FUNCTIONAL REQUIREMENTS**

**2.1.1 User Management**

R01: Admins can register students and instructors.

R01.01: Upload of ID photos and personal data during student registration.

R01.02–R01.05: Role-based permissions for user/device management and security.

**2.1.2 Attendance Tracking**

R02: Lecturers scan QR codes using mobile/laptop to record attendance.

R02.03: Lecturers can drop students with 3 consecutive absences.

R02.05–R02.06: Attendance reports for admins; students can view records.

**2.2 NON-FUNCTIONAL REQUIREMENTS**

2.2.1 Security

R04.01: Role-Based Access Control (RBAC).

R04.02: Data encryption controlled by admin.

R04.03: Multi-Factor Authentication for lecturers.

R04.04: System operates over HTTPS using SSL.

2.2.2 Infrastructure

R05.01–R05.03: Cloud-based MongoDB Atlas storage, no API integration.

2.2.3 Deployment

R06: Initial checking – May 15, 2025.

R07: Full deployment – May 22, 2025.