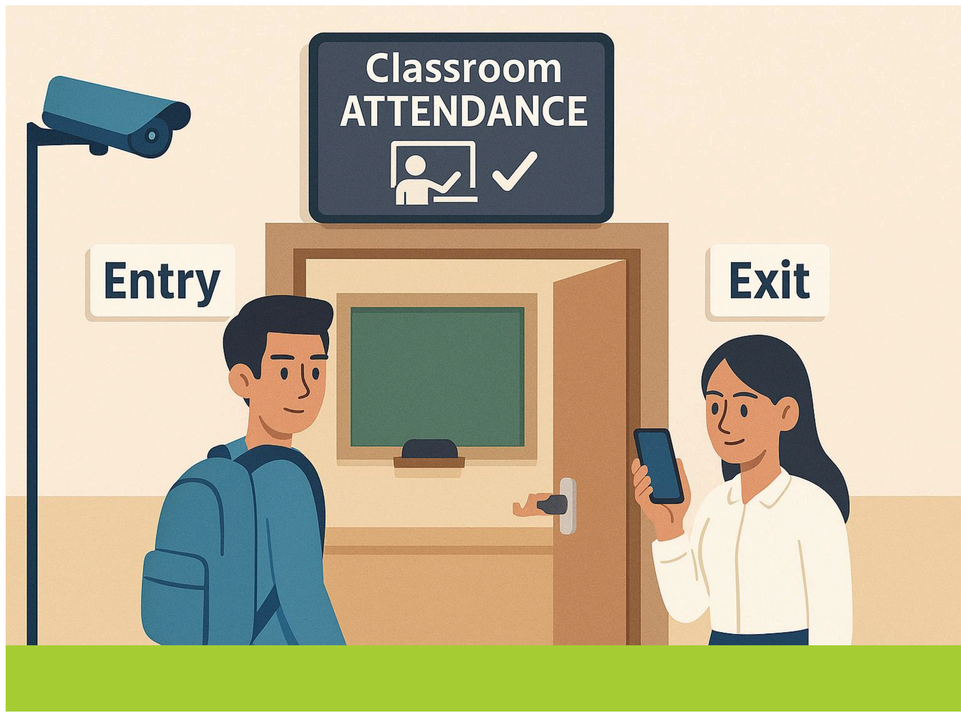
AI-Powered Attendance System for a Modern Academy

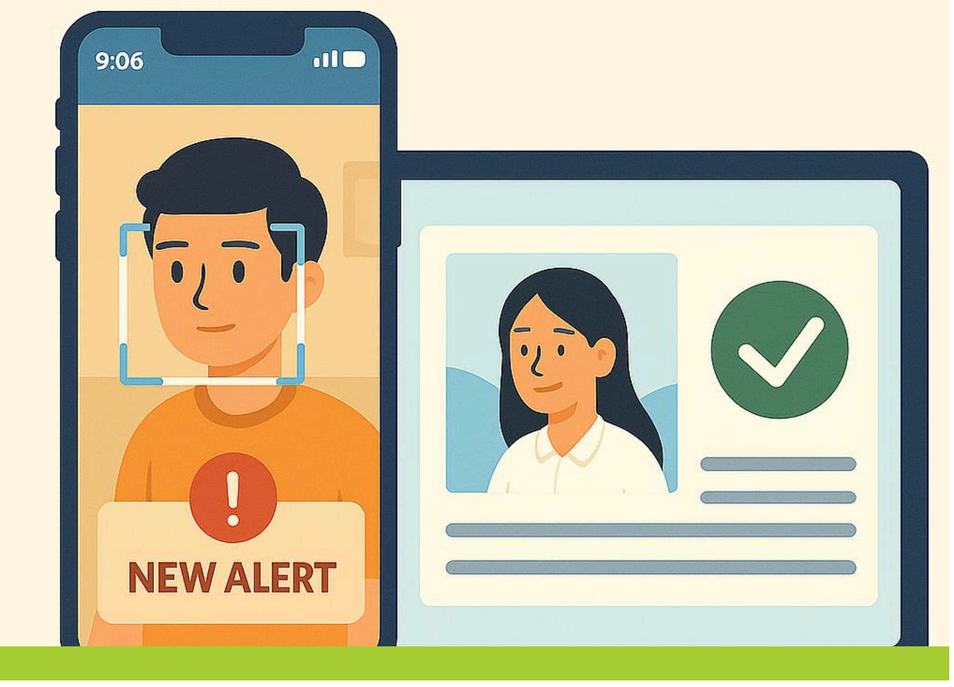
We built a custom AI Camera-based Attendance System designed specifically for academies. This intelligent system utilizes facial recognition, configurable rules, and real-time notifications to automate and secure attendance workflows — ensuring accountability without human intervention.

Classroom entry/exit attendance of student in class room



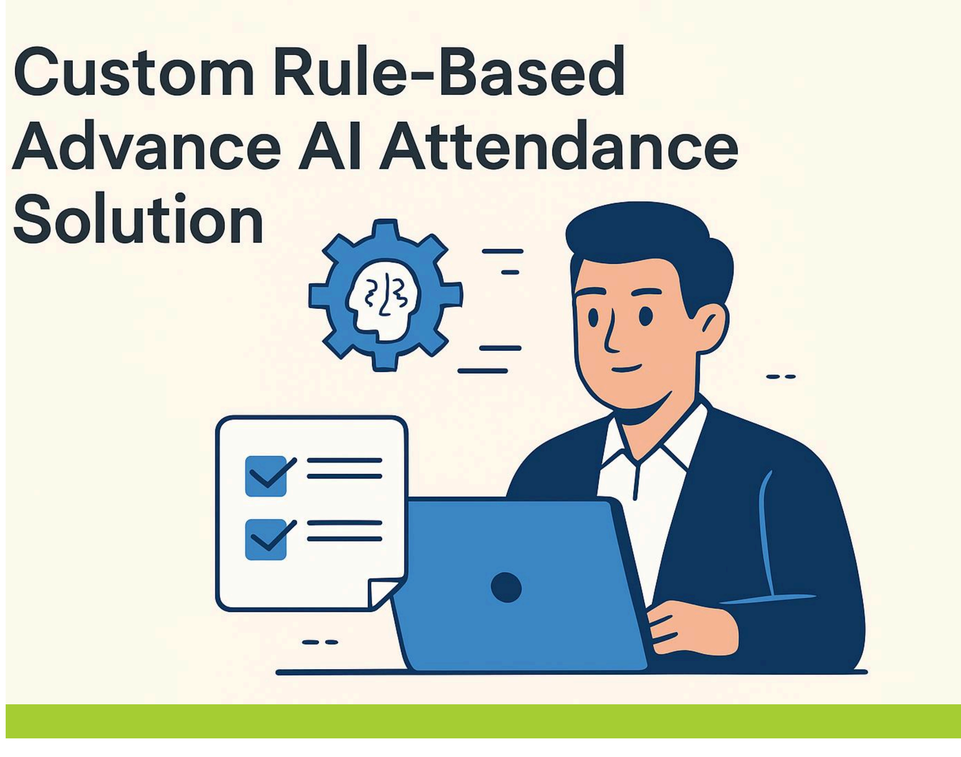
Student entry in library

Student tracking in cafeteria and playground



Getting real time alerts with images and attendance report on CMS

Custom rule based advance ai attendance solution



Client Overview

Client	A progressive academy committed to digital transformation and operational efficiency
Use Case	Automating student attendance through AI-based facial recognition using smart cameras
Location	India
End Users	Students, Faculty Members, Administrative Staff

Problem Statement

Traditional attendance tracking methods in the academy were:

- Time-consuming and inefficient
- Prone to proxy attendance
- Dependent on manual entry, leading to record inaccuracies
- Lacking real-time visibility and centralized monitoring

The academy required a smart, secure, and contactless attendance solution that could be reliably deployed across the entire campus.

System Workflow

Initial Setup	• Person Types: Define categories such as Student, Staff, Visitor • Rules: Configure attendance policies — shift timings, zones, alert conditions • Devices: Register and manage camera devices installed across the site
AI Server Configuration	• Setup includes fields like CPU, RAM, OS, MAC address, IP, etc. • Seamless two-way communication using MQTT protocol with on-site cameras
Person Enrollment	Capture the following: • Name, Age, Gender • Unique Person Number (e.g., Student ID) • Face Photograph • Linked Rules and Camera Devices • Person Type (Student, Staff, etc.)

Live Attendance Capture	• AI cameras detect and verify faces in real time
	• The server matches identities and generates alerts for:
	  • Recognized Individuals
	  • Unknown Faces
	  • Obstructed or Unclear Faces
	  • Missing Individuals (based on rule violations)

Monitoring Dashboard	• Web-based dashboard with live alerts and attendance logs • Report downloads with filters (date, shift, person type, etc.)

Tech Stack Overview

Frontend	React.js (Admin Portal & Enrollment System)
Backend	Node.js with Express.js
Database	MongoDB
AI Engine	Python-based face recognition
Camera Communication	MQTT Protocol
Deployment	On-premise or Cloud infrastructure supported

Core Features Delivered

- Real-time facial recognition attendance
- Intelligent rule-based tracking per person type
- High-definition camera integration with AI servers
- Instant alerts for identity mismatches and absences
- Attendance analytics and downloadable reports
- Role-based access control for admins and staff
- Secure and streamlined enrollment workflows

Deployed Across Multiple Locations

This solution has been successfully implemented in:

- Multiple private and government academies
- Universities and higher education institutions
- Coaching centers and training institutes
- School campuses seeking secure, automated attendance

Its modular architecture allows us to deploy and configure the system for institutions of varying sizes and needs, including multi-branch setups.

Key Results

- 90% reduction in manual attendance effort
- Zero tolerance for proxy or duplicate entries
- Continuous 24/7 monitoring with real-time response
- Significantly reduced administrative workload
- Fully contactless and student-friendly system

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