Casual X Coders

SMART INDIA HACKATHON 2025

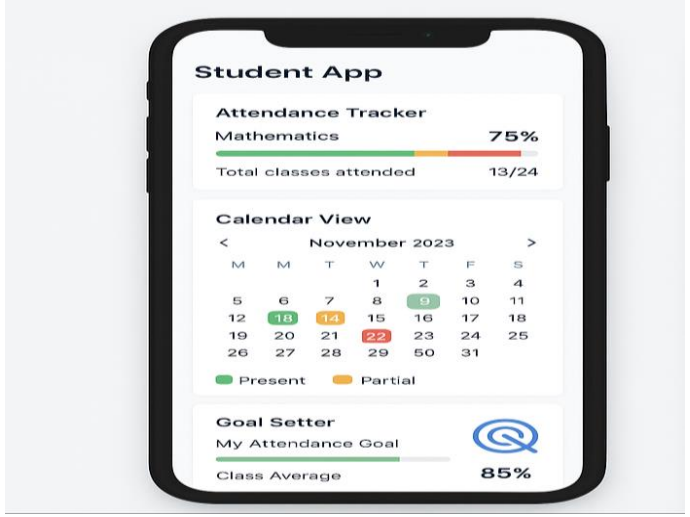
TITLE PAGE

- **Problem Statement ID – 25016**
- **Problem Statement Title-Automated Student Attendance Monitoring & Analytics System for Colleges**
- **Theme-Smart Education**
- **PS Category- Software**
- **Team ID-**
- **Team Name: Casual X Coders**

Casual X Coders

Smart Attendance System

SMART INDIA HACKATHON 2025

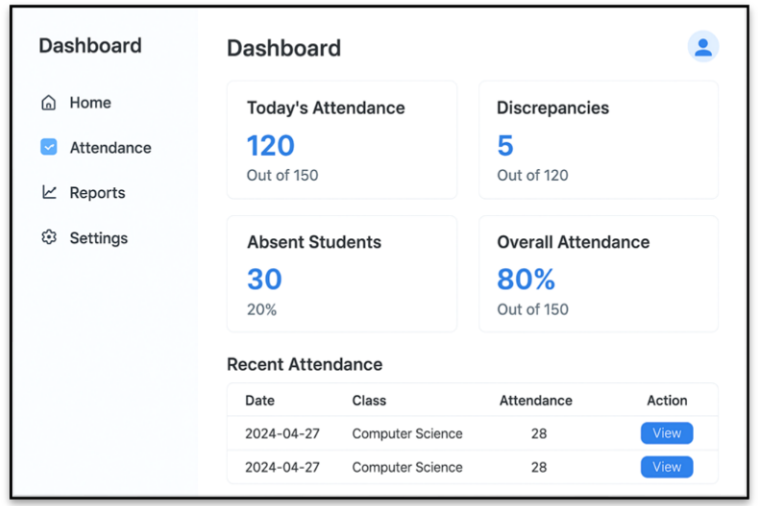


❑ Detailed explanation of the proposed solution

- A smart student attendance system that uses **face recognition** to verify students at the time of entry and exit.
- The system records **attendance duration automatically**, ensuring students are marked based on actual presence.
- Attendance data is stored in a **centralized cloud platform**, accessible via dashboards for faculty, admins, and students.
- **Automated alerts** when a student's attendance falls below the required criterion, they are notified instantly via email.

❑ How it addresses the problem

- Saves valuable teaching time
- Reduces errors and prevents proxy attendance
- Enhances transparency and accountability in academic processes.
- Supports digital transformation of higher education institutions

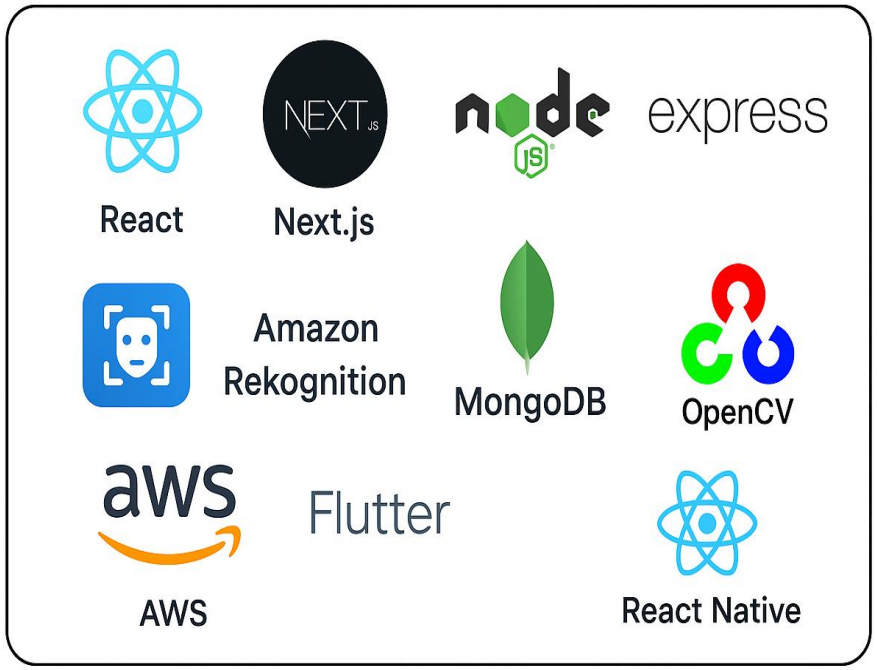


❑ Innovation and uniqueness of the solution

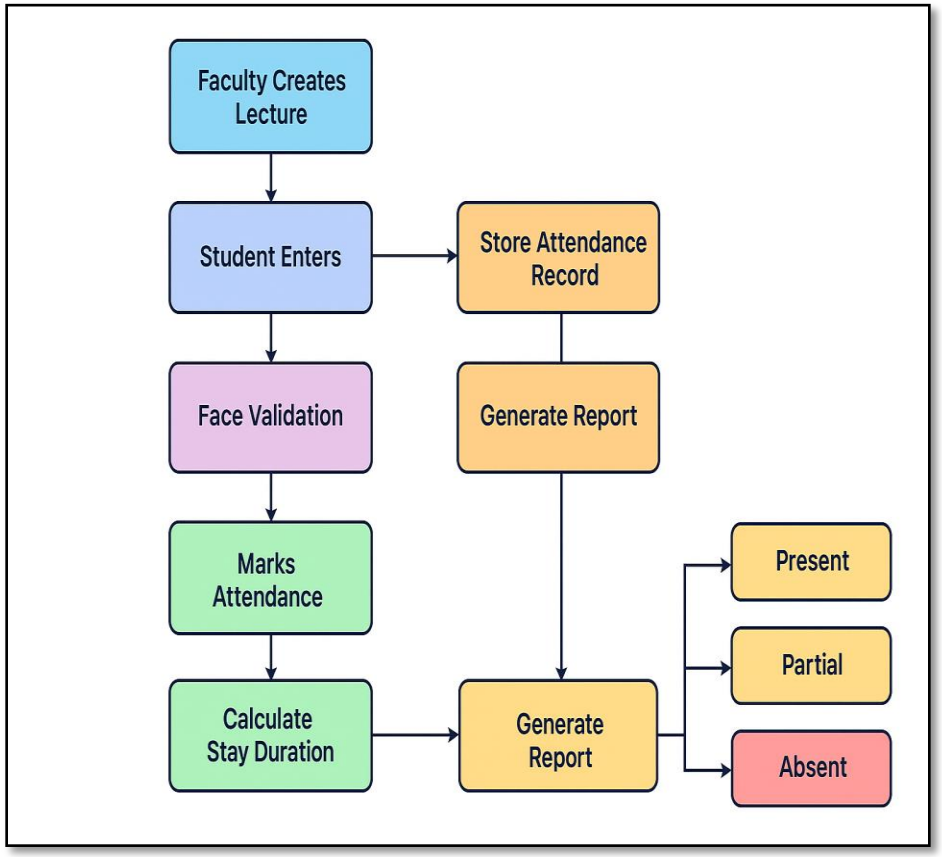
- **Dual validation approach** (entry + exit) ensures fairness and prevents misuse.
- Duration-based attendance tracking rather than simple presence marking.
- Hybrid adaptability → works in both offline and online environments.
- AI-powered analytics to identify disengaged students and predict attendance trends.
- Scalable & inferable with existing ERP/LMS platforms

TECHNICAL APPROACH

Technologies Used



Flow Chart



FEASIBILITY AND VIABILITY

❑ Analysis of the feasibility of the idea

- **Technically feasible** using existing infrastructure (CCTV/webcams, biometric devices, or dedicated cameras).
- **Cloud-based design** ensures scalability across multiple classrooms and institutions.
- **Compatible with existing ERP/LMS platforms** for seamless integration.
- **Mobile + web dashboards** make adoption easy for students, faculty, and administrators.

❑ Potential challenges and risks

- Missed exit scans
- Face recognition accuracy issues in poor lighting
- Data privacy and security
- Internet downtime

❑ Strategies for overcoming these challenges

- **Auto-exit handling →** if exit scan is missed, system assumes class end time (flagged for review).
- **Improved accuracy** → multiple cameras, liveness detection, and AI-based face models.
- **Data security →** encryption, anonymization, and compliance with data protection policies.
- **Offline-first design →** attendance cached locally and synced once internet is restored.

.

IMPACT AND BENEFITS

❑ Potential impact on the target audience

- **Students** → Get fair, transparent, and real-time attendance with instant alerts when below required criteria.
- **Faculty & Administrators** → Save valuable teaching time, reduce manual errors, and gain actionable insights on student engagement.
- **College Management** → Centralized cloud reports simplify audits, accreditations, and improve institutional efficiency.
- **Education Departments & Policymakers** → Access to accurate, large-scale attendance analytics for data-driven policy making.
- **Overall** → Enhances accountability, promotes digital transformation, and improves academic discipline.

❑ Benefits of the solution

- **Social** → Promotes fairness, accountability, and discipline among students; builds trust between students and faculty.
- **Economic** → Saves teaching hours, reduces paperwork and administrative costs, and optimizes institutional resources.
- **Educational** → Provides real-time insights to faculty, helps identify at-risk students early, and improves overall learning engagement.
- **Technological** → Drives digital transformation in higher education with AI, cloud, and biometric integration.
- **Environmental** → Eliminates paper-based registers and manual records, reducing paper waste and promoting sustainability.

RESEARCH AND REFERENCES

Face Recognition in Attendance Systems
IEEE Research Paper: *Facial Recognition Based Attendance System*
☐https://ieeexplore.ieee.org/document/8402113

AI in Student Engagement & Early Risk Detection
UNESCO Report: *AI and Education – Guidance for Policymakers*
☐https://unesdoc.unesco.org/ark:/48223/pf0000376709

Accreditation Needs (NAAC, NIRF, AICTE)
NAAC Handbook for Accreditation Framework
☐http://naac.gov.in/images/docs/Manuals/Universities-Manual-25July2017.pdf

LMS & ERP Integration
Moodle Official Docs (Open Source LMS widely used in colleges)
☐https://moodle.org