



# FaceAuth 2.0: Student Attendance System

## An AI-Powered, Contactless & Secure Smart Campus Solution

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# The Inefficiency of Legacy Attendance

## Legacy Barriers



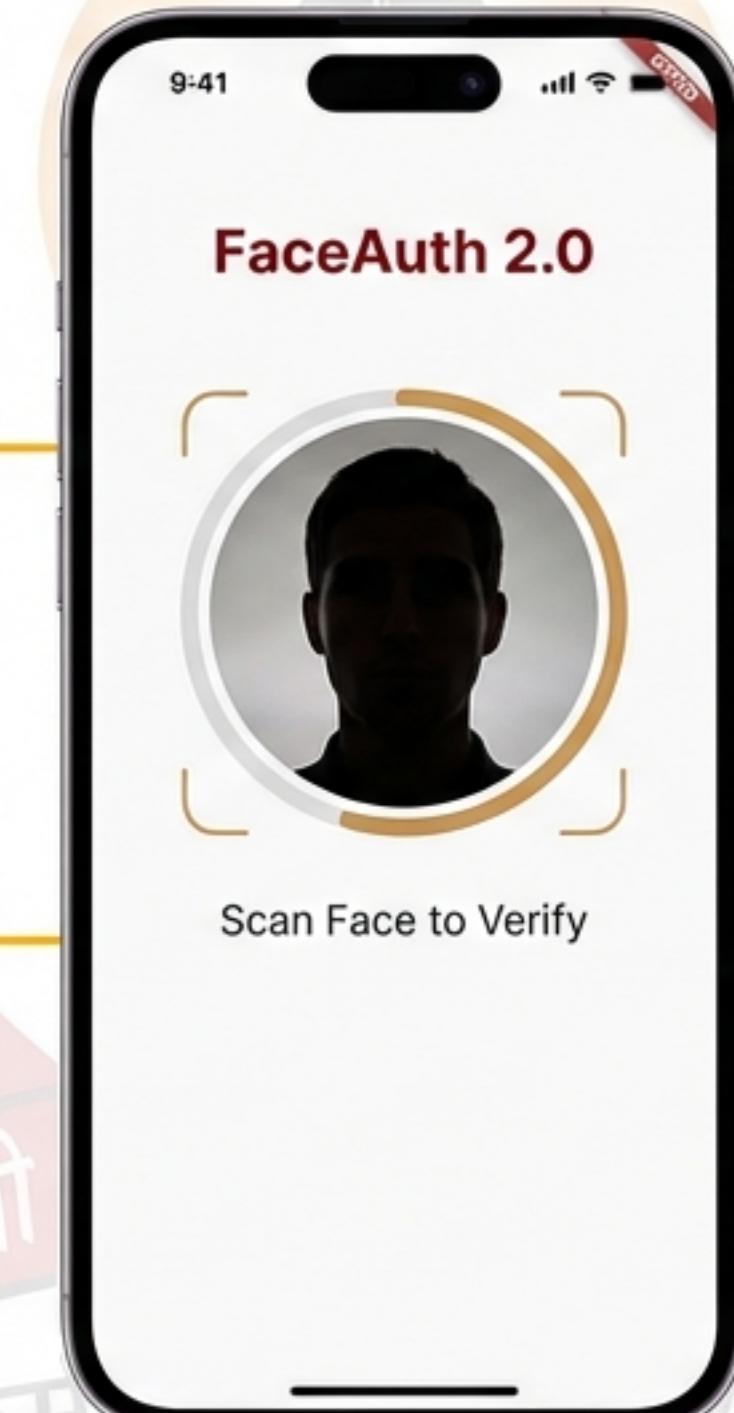
- **Manual Systems:** Time-consuming roll calls & proxy attendance.
- **Biometrics:** Hygiene risks & hardware wear.
- **Digital Logs:** ID cards are easily lost or swapped.

## The Critical Gap

Existing camera systems often lack Liveness Detection, making them vulnerable to spoofing via photographs or videos.

The Goal: An automated, secure, contactless system integrated with Institutional ERP.

# Introducing FaceAuth 2.0



**Deep Learning Accuracy:**  
High-precision verification  
via DeepFace.

**Anti-Spoofing:**  
Liveness Detection  
(Blink/Motion Check).

**Smart Automation:**  
Auto-model training &  
ERP Sync.

**Cross-Platform:** Native  
Flutter Performance.

# Technology Stack & Tools

## Frontend (Mobile)



### Flutter (Android/iOS)

- Packages: camera, liveness\_detection\_plugin

## Backend & Logic



### Python + Flask API

- Business Logic & DB Communication

## AI & Computer Vision



### OpenCV (Processing)

- DeepFace (Recognition & Embeddings)

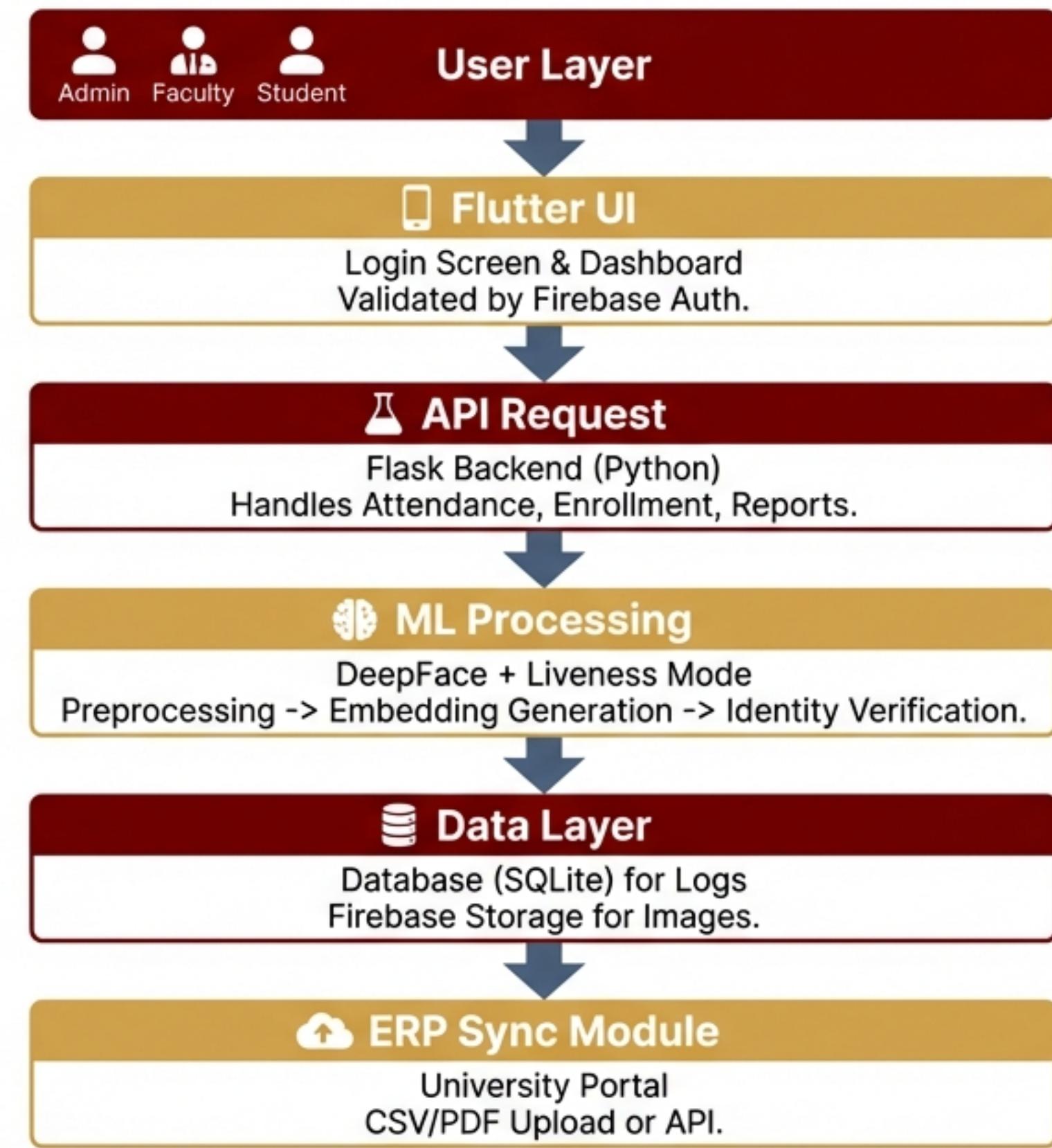
## Data & Cloud



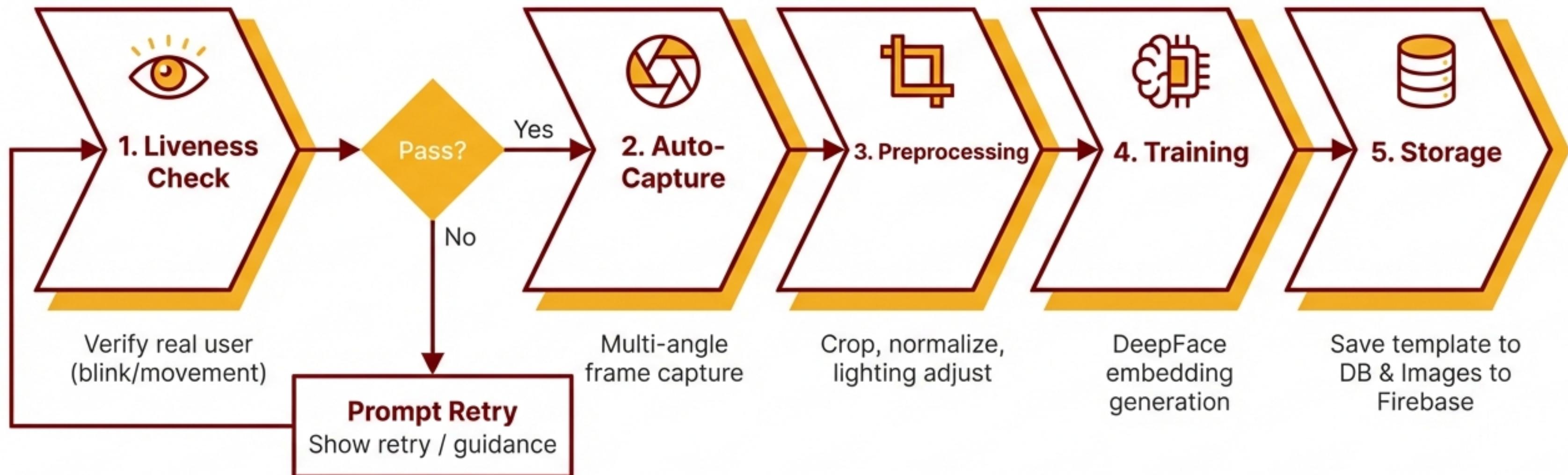
### Firebase (Auth & Image Storage)

- SQLite / MySQL (Relational Data)

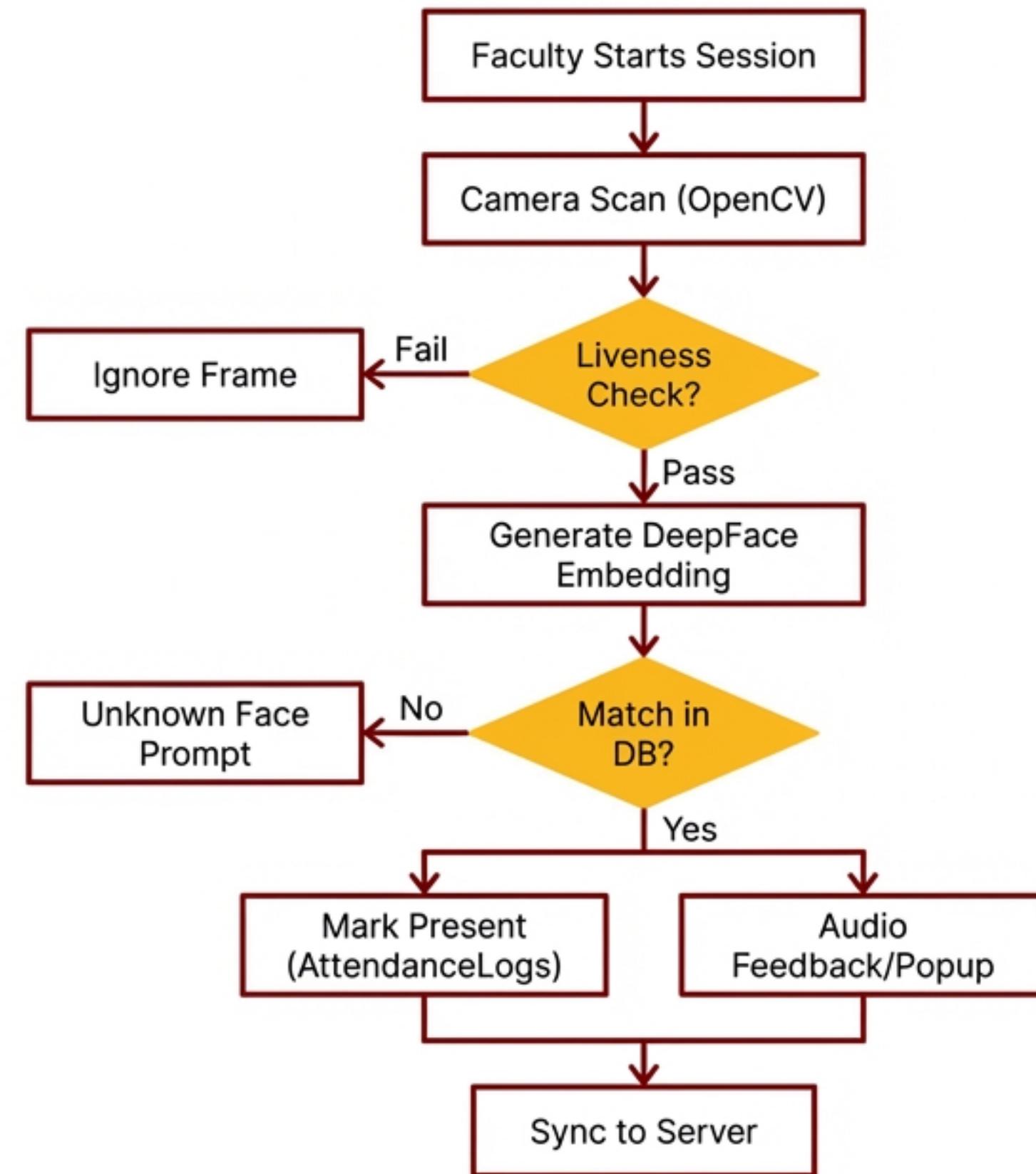
# High-Level System Architecture



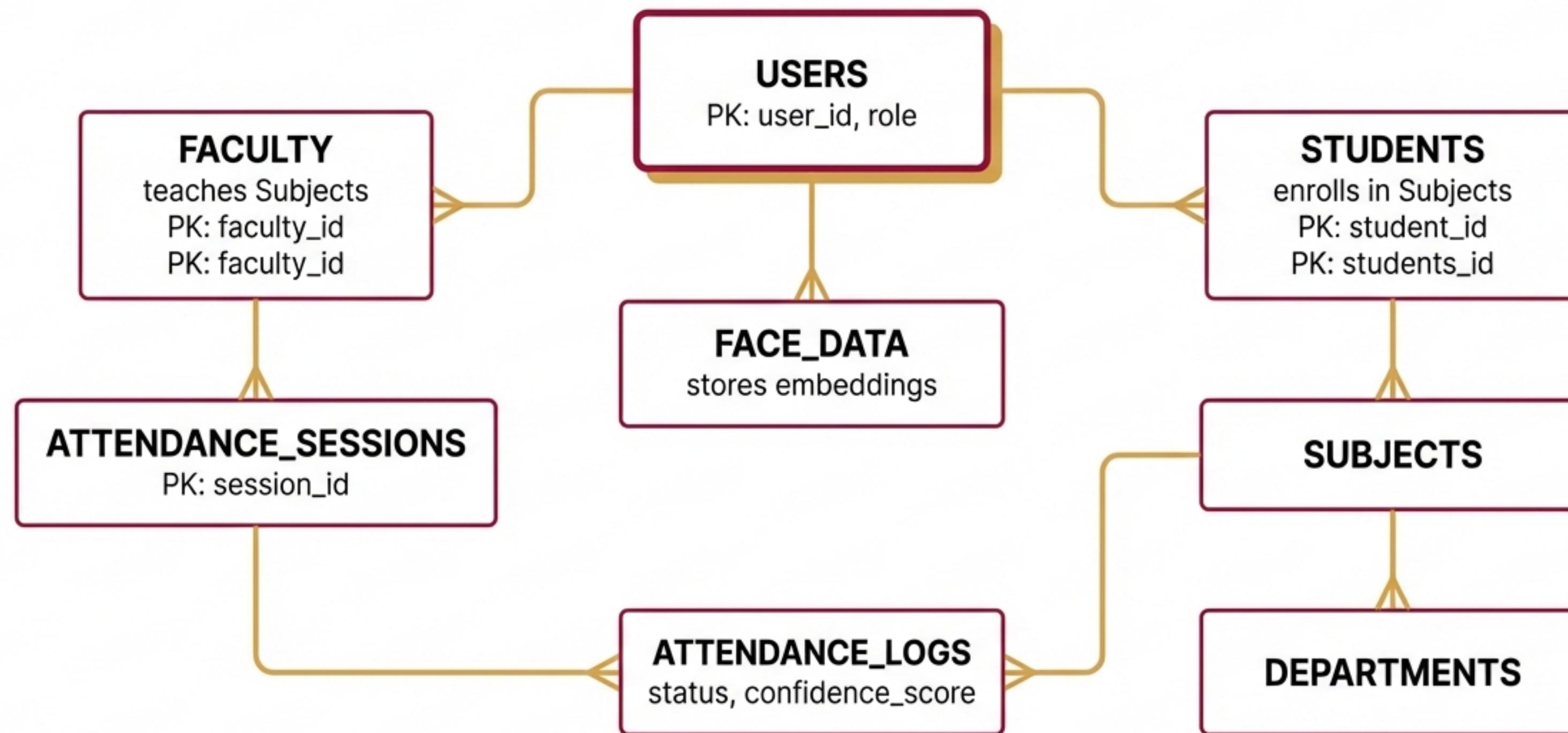
# Intelligent Face Enrollment Strategy



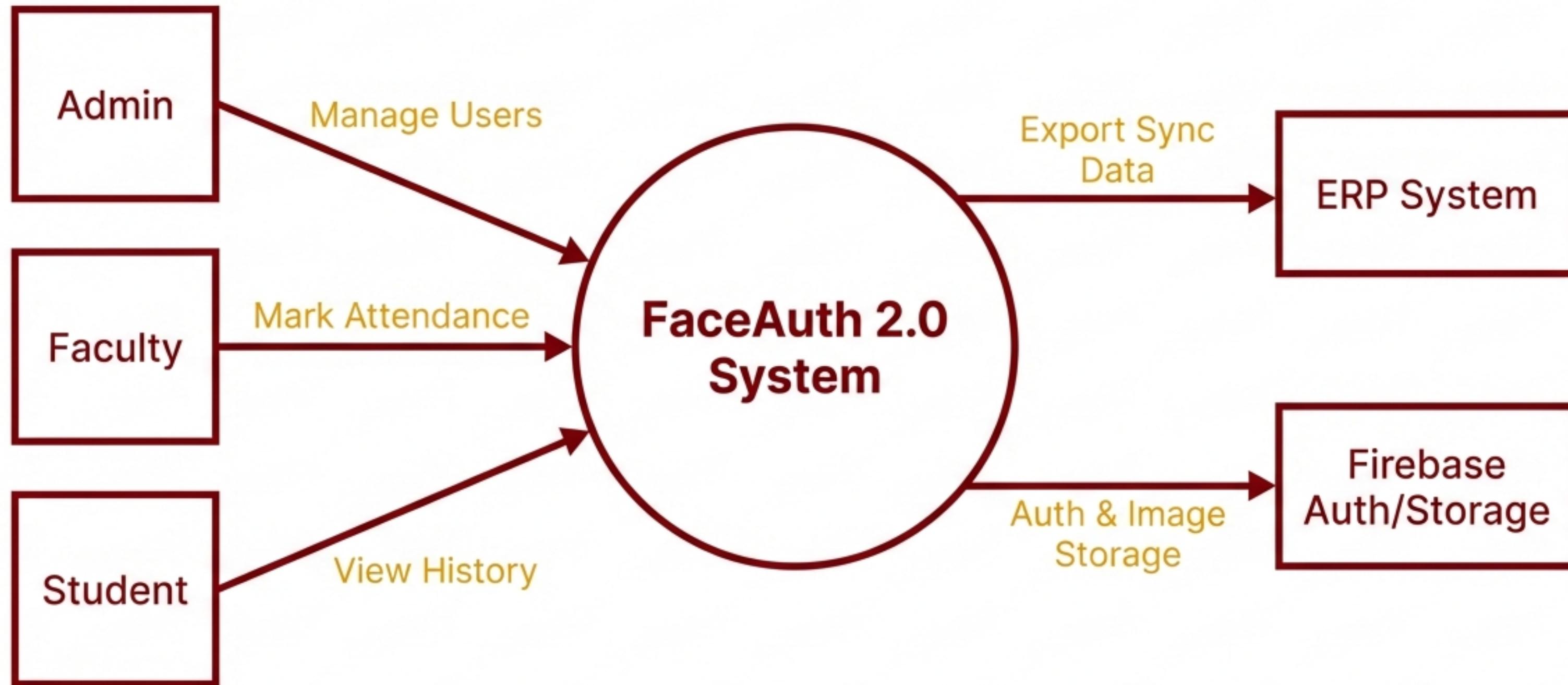
# Real-Time Attendance Logic



# Database Schema & Relationships (ERD)



# System Data Flow (DFD Level 0)



# Role-Based Modules: Admin & Faculty



## Admin Module (The Controller)

- ✓ Manage Faculty/Student Profiles & Departments.
- ✓ Oversee Face Enrollment Quality.
- ✓ Execute Global ERP Sync.

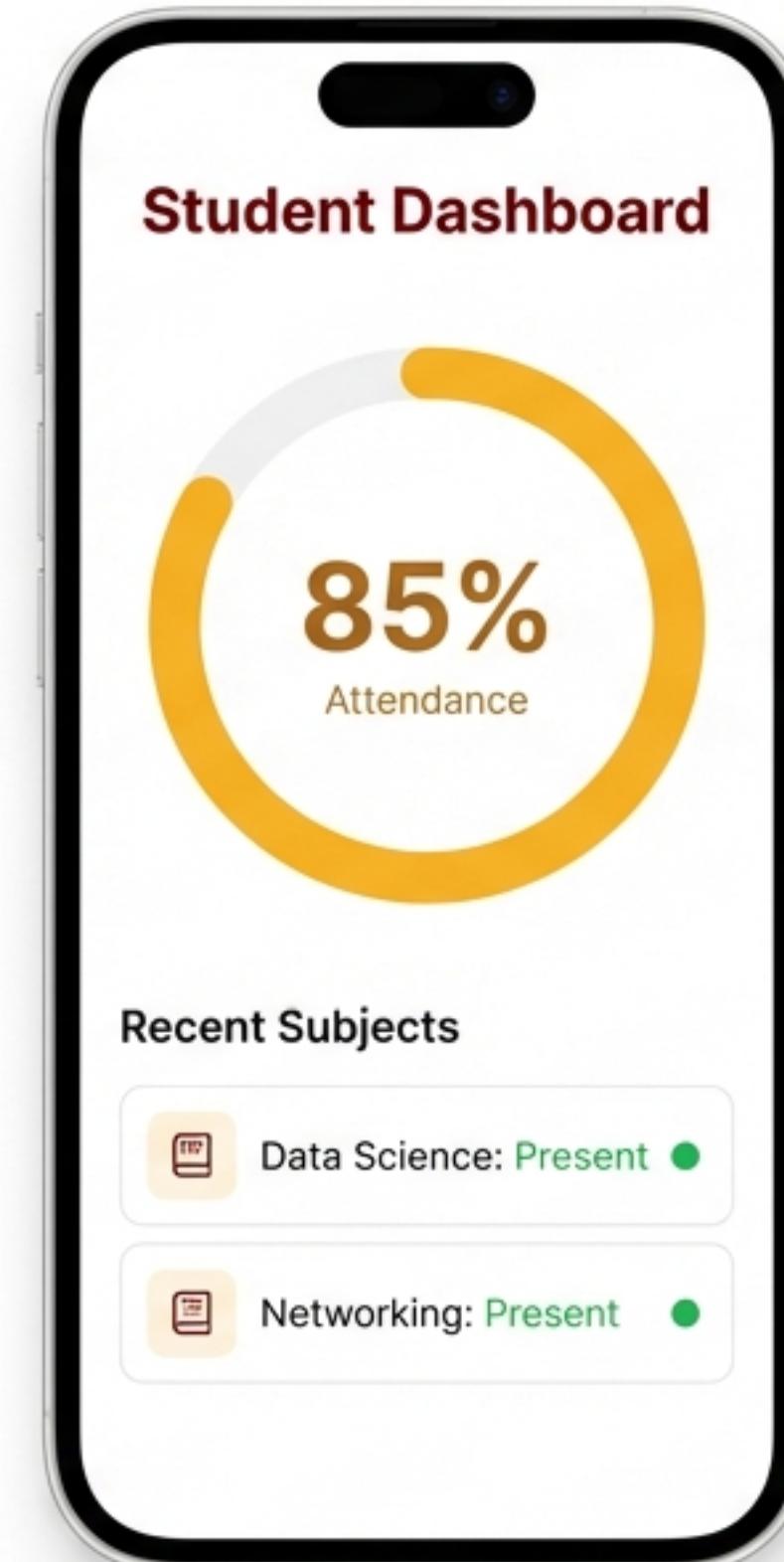


## Faculty Module (The Operator)

- ✓ Secure Login via Face Auth or Credentials.
- ✓ Real-Time Detection & Session Management.
- ✓ Manual Correction & Report Export (PDF/Excel).

# Student Module & User Experience

- ✓ **Transparency Dashboard:** Real-time view of overall and subject-wise attendance.
- ✓ **Punch History:** Verifiable daily logs to prevent disputes.
- ✓ **Smart Alerts:** Automated notifications if attendance drops below 75%.
- ✓ **Support:** Direct channel to Admin for data correction.



# ERP Integration & Security Protocols



## Security First

- ✓ Firebase Auth for sessions.
- ✓ Face embeddings stored as encrypted BLOBs.
- ✓ HTTPS API Channels.



## Data Export

- ✓ Structured export of Attendance\_Logs.
- ✓ Supports CSV/PDF generation.



## ERP Sync

- ✓ Direct API integration or File Upload to University Portal.
- ✓ Sync logs tracked in database.

# System Scope & Requirements Met

## Functional Scope Achieved

-  Real-time detection (<1 sec capture).
-  Role-based dashboards (Admin/Faculty/Student).
-  Automated reporting and alerts.

## Technical Environment

-  Mobile: Android 8.0+ / iOS 12+.
-  Camera: 5MP+ required (8MP+ recommended).
-  Connectivity: Stable Internet for Cloud Sync (Offline mode for temp storage).

# Limitations & Future Roadmap

## Current Limitations

- ⚠ - Lighting: Accuracy depends on ambient light.
- ⚠ - Occlusion: Masks/Helmets prevent detection.
- ⚠ - Hardware: Processing speed varies by device CPU.

## Future Enhancements



# Conclusion: The Path to a Smart Campus

**FaceAuth 2.0 successfully bridges the gap between manual administration and AI automation.**



Eliminated Proxy  
Attendance & Errors



Enhanced Security via  
Liveness Detection



Delivered a Scalable  
Flutter Solution