TECHNICAL CASE STUDY · REAL-TIME PLATFORM

Skaeo EduSense

A multi-tenant, real-time campus attendance and presence platform with nine apps and portals and Bluetooth beacon detection, architected and built by Nuvayu Tech for a client. Live on university campuses in India.

React 19 + Vite + TypeScript | Flutter (7 apps, 1 codebase) | Express + Knex + PostgreSQL | Multi-tenant | BLE + 1:1 face match

Skaeo EduSense is our client's product (skaeo.com). This brief describes the engineering work Nuvayu Tech did on it.

THE CORE MECHANIC

- **Passive presence:** Bluetooth (BLE) beacons in each classroom are detected by students' phones, so attendance is recorded as students walk in. No roll call and no tapping.
- **Anti-proxy check:** partway through a class, faculty push a short code that can only be answered from inside the room.
- **Real-time state engine:** one state mechanism keeps every app and portal consistent the moment anything changes, whether that's attendance, a leave approval or a gate entry.
- **Rules applied automatically:** each student is tracked against the institution's 75% attendance requirement, with detention lists built and mentors and parents alerted early.

NINE APPS AND PORTALS SHIPPED

App or portal	Who uses it
Admin Portal (web)	Leadership, deans, heads of department, admin and finance
Super-Admin Portal (web)	The client's own team, managing every institution on the platform
Faculty App	Attendance, schedule, leave, mentorship
Student App	Attendance %, marks, timetable, mentor, fees
Parents App	Read-only, multiple children, Hindi plus 9 other Indian languages
Staff App	Beacon-based duty clock, HR helpdesk
Security Guard App	Hindi-first; assisted visitor check-in with 1:1 face match
Vice-Chancellor App	Strong sign-in, swipe-to-approve decisions
Student App (earlier version)	Kept running for existing users

TECH STACK

Web
React 19 + Vite + TypeScript + Tailwind CSS

Mobile
Flutter: 7 production apps from one codebase; native BLE scanning on iOS and Android

Backend
Node.js, Express, Knex, PostgreSQL; multi-tenant from the ground up

Real-time and infrastructure
Single-server scheduled-job model, designed to move to serverless as load grows

ENGINEERING DECISIONS

- **Multi-tenant from day one:** every record is scoped to its institution, so the client can add a new campus without a new build or a separate deployment.
- **One Flutter codebase, seven apps:** role-specific apps share one codebase and design system, so a fix ships to every app at once.
- **Bluetooth on both platforms:** native beacon scanning on iOS and Android, each with its own background and permission rules, behind one shared attendance flow.
- **Privacy by design:** face match is 1:1 only, confirming a person against their own record and never scanning a crowd. Consent is recorded, with an audit trail on every change, built for India's Digital Personal Data Protection Act.
- **Built for the people using it:** Hindi-first guard tablets and a Parents app in 10 Indian languages, in native script.

IN PRODUCTION TODAY

- Full attendance module, with Bluetooth beacon detection and the anti-proxy check
- The real-time state engine keeping every app and portal in step
- Bulk import of a semester's students and timetables
- Presence notifications for students, mentors and parents
- Away-pass and staff duty workflows
- Consent records with a full audit trail

We build the systems others call "too complex"

Multi-tenant from day one, Bluetooth hardware integration, privacy-first face match, and nine apps and portals from one team, shipped to production.

Build with us: contact@nuvayutech.com | nuvayutech.com