

## Project Idea

CampusEvent Pro is a full-stack web application designed to centralize event management for academic institutions, replacing disconnected tools (e.g., social media posts, paper forms) with an automated, role-based system. Key innovations include:

### 1. Role-Specific Workflow Automation

- **Granular Access Control:** JWT-based authentication segregates students, organizers, and administrators. Students access event feeds; organizers use templated publishing tools; administrators monitor compliance via keyword scanning (e.g., "alcohol") and PDF audit reports.
- **Third-Party Integration:** WeChat OAuth 2.0 login covers 85% of student users via SUSTech's 2024 survey data, reducing sign-up friction.

### 2. Smart Event Lifecycle Management

- **Dynamic Publishing:** Rich-text editor (Quill.js) supports embedded videos, image galleries, and PDF attachments (e.g., safety guidelines) with AWS S3 storage.
- **Intelligent Registration:** Custom forms with conditional logic (e.g., dietary preference fields only for food-related events) and Redis-managed waitlists using SKIP LOCKED transactions to prevent double-booking.

### 3. Anti-Fraud & Analytics

- **QR Check-In Validation:** GPS-tagged QR codes (qrcode library + GeoDjango) ensure attendees are physically present, reducing proxy sign-ins by  $\approx 60\%$  (NUS 2023 case study).
- **Data-Driven Optimization:** ECharts-powered dashboards visualize participation rates by department/event type, enabling data-backed resource allocation.

Built with Django and React, the platform uniquely combines academic compliance requirements with enterprise-grade automation, targeting a 45% reduction in organizers' administrative workload.

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## Target Users

### 1. Students (Primary End-Users)

- **Pain Point:** 78% report frustration with tracking events across 5+ platforms (SUSTech 2024 survey). Missed deadlines due to inconsistent reminders.
- **Solution:**
  - Unified calendar view with filters (date/category/interest tags).
  - SMS alerts (Twilio API) 24hrs pre-event and waitlist auto-enrollment notifications.

### 2. Club Organizers (Power Users)

- **Challenge:** Manual RSVP management consumes 10–15hrs weekly, delaying content preparation.
- **Solution:**
  - Drag-and-drop form builder (React-JSONSchema-Form) with validation (file types/size limits).

- Real-time dashboards tracking attendance demographics (year/major) via Pandas aggregations.

### 3. Campus Administrators (Supervisors)

- **Need:** Ensure events align with institutional policies (safety, non-commercial).
  - **Solution:**
    - Automated flagging of non-compliant event descriptions for manual review.
    - Semesterly PDF reports comparing engagement metrics across departments (Plotly + reportlab).
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## Scope of Work

### Core Features

#### 1. Authentication & Security

- JWT token issuance/refresh flow with AES-256 encryption.
- Rate limiting (50 requests/min) to mitigate DDoS attacks.

#### 2. Event Management Suite

- **Publishing Toolkit:** Image compression (<5MB) using Pillow library.
- **Form Logic Engine:** Required fields (text), optional attachments (PDF/PNG), and deadline-based submissions.

#### 3. Verification & Reporting

- Dynamic QR codes with 5-minute expiry to prevent screenshot reuse.
- Automated CSV/PDF exports (Pandas) for administrative reviews.

### Technical Implementation

- **Frontend:** React.js + Ant Design Pro Components (Table/Form/Chart libraries).
- **Backend:** Django REST Framework (JWT auth, Redis cache, Celery tasks).
- **Database:** PostgreSQL v15 with row-level security policies.
- **DevOps:** Dockerized deployment on AWS EC2, CI/CD via GitHub Actions.

### Validation Strategy

- **Load Testing:** Simulate 500 concurrent users with Locust to assess API response times (<2s).
- **Security Audit:** OWASP ZAP penetration testing for SQLi/XSS vulnerabilities.
- **Usability Testing:** 30-person beta trial measuring task success rates (target: 90%).