Project Proposal

1   Team Members

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2   Topic: CUHK Venue and Equipment Booking SaaS

2.1   Planned N-1 Features

1. ActionMailer to send email notification to the user when the booking is confirmed and to the admin when there is pending approval.

2. Sidekiq+Redis to implement daily digest to each department admin (e.g. "Today's bookings in the department", "Pending approvals".)

3. ActionCable to implement real-time booking status updates.

4. Chartkick dashboard to show the usage statistics of the venues or equipments.

2.2   Overview

Multi-Tenant SaaS Application built with **Rails 7.2.3** with Conflict detection and Approval workflow as the Core features. We will use PostgreSQL for the database and RSpec for testing.

Data Models:

- **Department** (tenant isolation: Engineering, Arts, Medicine, etc.)

- **Resources** (2 types: Room or Equipment)

- **Booking** (status: pending $\rightarrow$ approved/rejected/expired)

- **User** (student submits, admin approves)

Major Pain Points and Solutions:

Pain Point	Solution
Fragmented booking Double booking may happen since every department have separate system for booking	**Conflict detection** Single Rails database to check the availability in real-time
No approval workflow Direct booking without approval may cause conflicts (e.g. proposed exam)	**Multi-stage approval** Student submits booking request $\rightarrow$ pending $\rightarrow$ admin can approve or reject
Poor visibility Lack of current room/equipment utilisation statistics	**Chartkick dashboard** Room usage charts + peak times + email notifications
Manual communication Need email chains to get approval without a centralised system, may be time-consuming	**ActionCable + ActionMailer** Admin approve $\rightarrow$ instant browser notification + confirmation email