

SMART INDIA HACKATHON 2025



- **Problem Statement ID –25028**
- **Problem Statement Title- Smart Classroom & Timetable Scheduler**
- **Theme-Smart Education**
- **PS Category- Software**
- **Team ID- QuantumForce**
- **Team Name : QuantumForce**



Smart Classroom & Time Table Scheduler

❖ Proposed Solution

- ❑ AI-driven web platform for smart classroom allocation & timetable generation.
- ❑ Manages resources, teacher availability & subject constraints dynamically.
- ❑ Multi-user panels (Admin, Teacher, Student) with conflict detection & auto rescheduling.

❖ Innovation & Uniqueness

- ❑ AI Query System: “Find me a lab for 40 students at 2 PM Friday.”
- ❑ Rescheduling Suggestions with 2–3 alternatives.
- ❑ Analytics Dashboard for classroom usage & teacher workload insights.
- ❑ Free Classroom Finder with real-time room availability.

Technologies



Backend: Python (Flask/Django) +
OR-Tools (Google Optimization)



Frontend: React.js / Angular +
Tailwind CSS



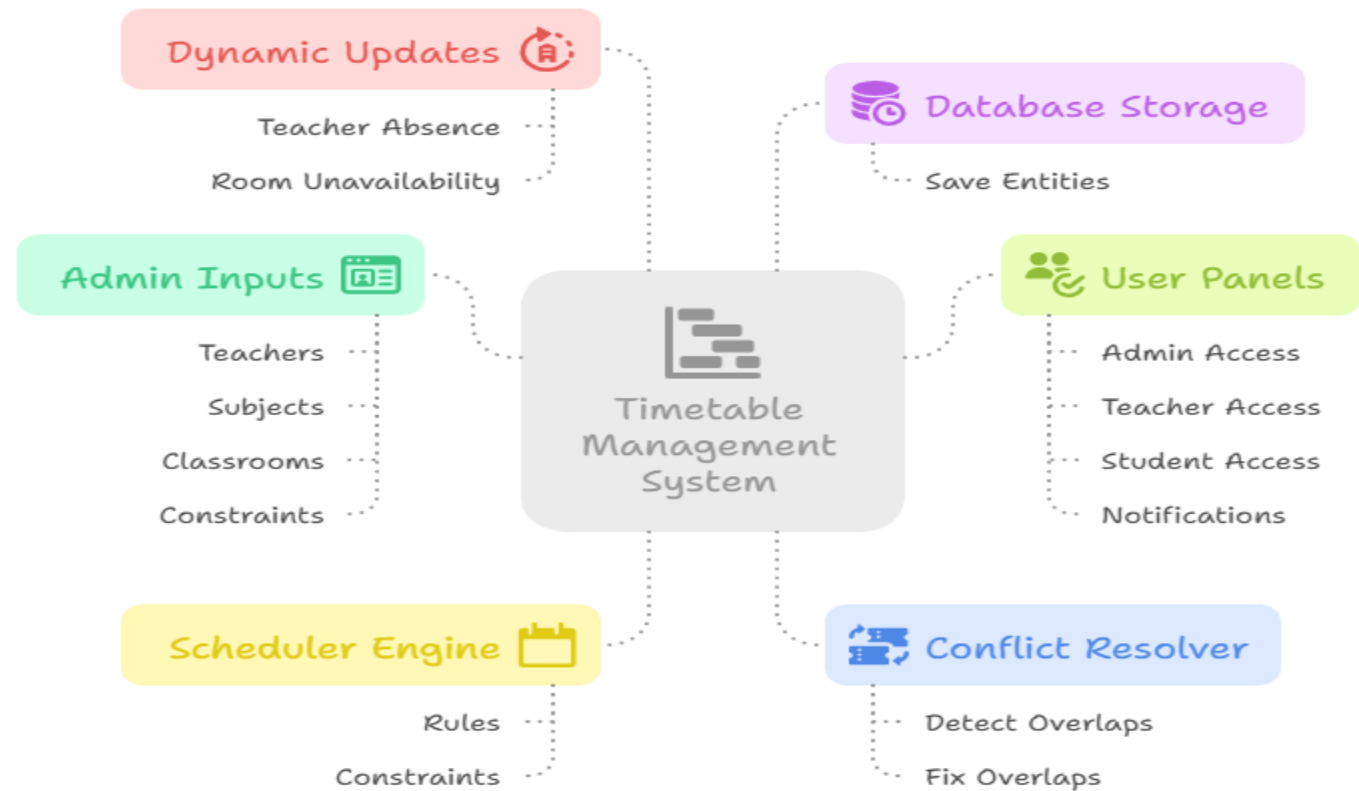
Database: PostgreSQL / MySQL



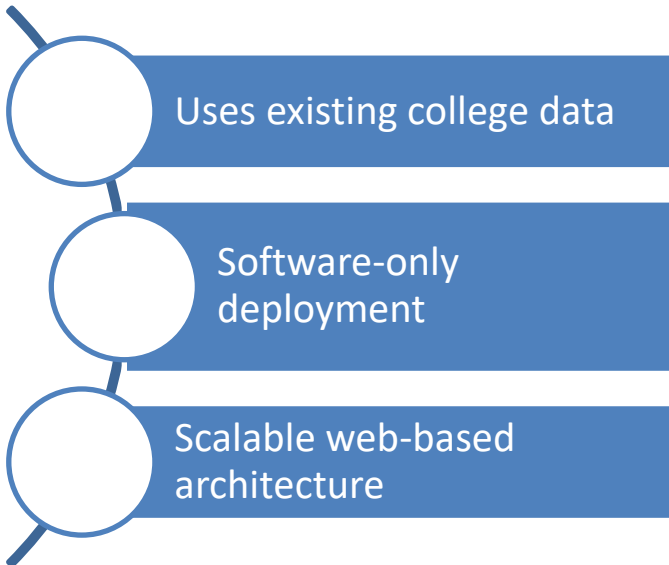
AI: Constraint-based scheduling +
NLP for query system

Methodology & Workflow

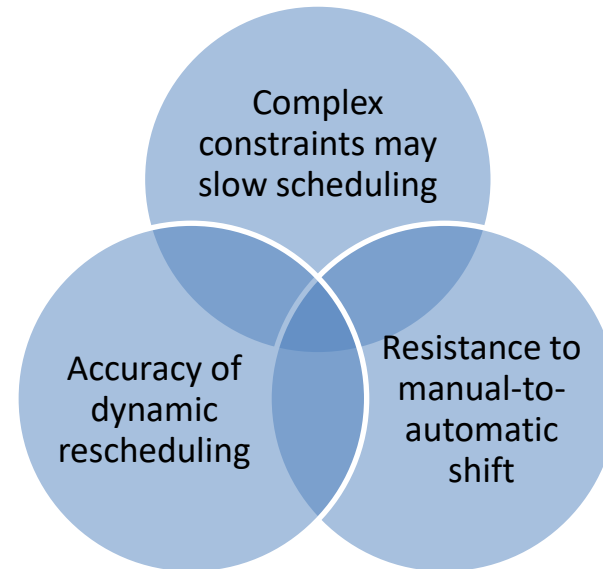
Timetable Management System Workflow



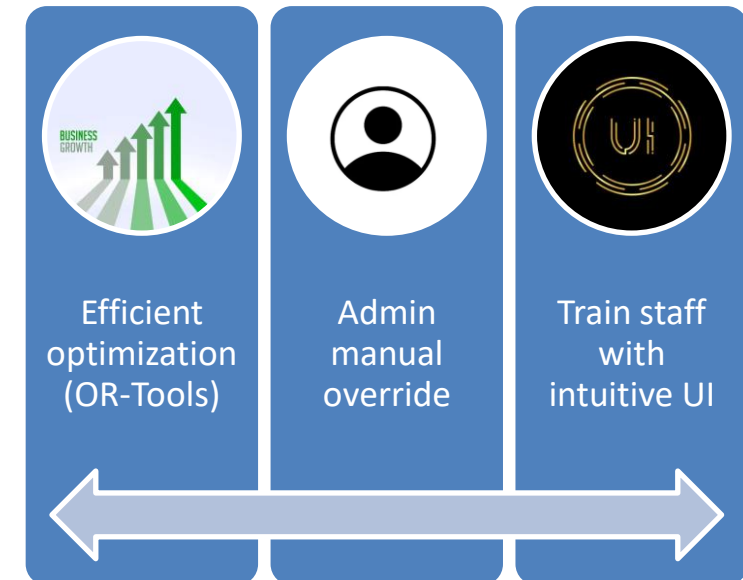
Feasibility



Challenges & Risks



Mitigation Strategies



impact

Eliminates manual scheduling burden for admins.

Ensures **fair workload distribution** for teachers.

Students get **instant timetable & updates** (no confusion in changes).

Benefits

Educational Efficiency → Saves 100+ admin hours per semester.

Resource Optimization → Prevents classroom under/over utilization.

Scalable Solution → Can be extended to universities, schools, coaching institutes.

Sustainable Impact → Paperless, transparent, and accessible scheduling.

Google OR-Tools: <https://developers.google.com/optimization>

Timetable Scheduling using AI: IEEE Xplore & ResearchGate papers.

Existing college ERP systems (Moodle, ERPNext) – studied limitations.

Case studies of scheduling challenges in universities.