SMART INDIA HACKATHON 2025

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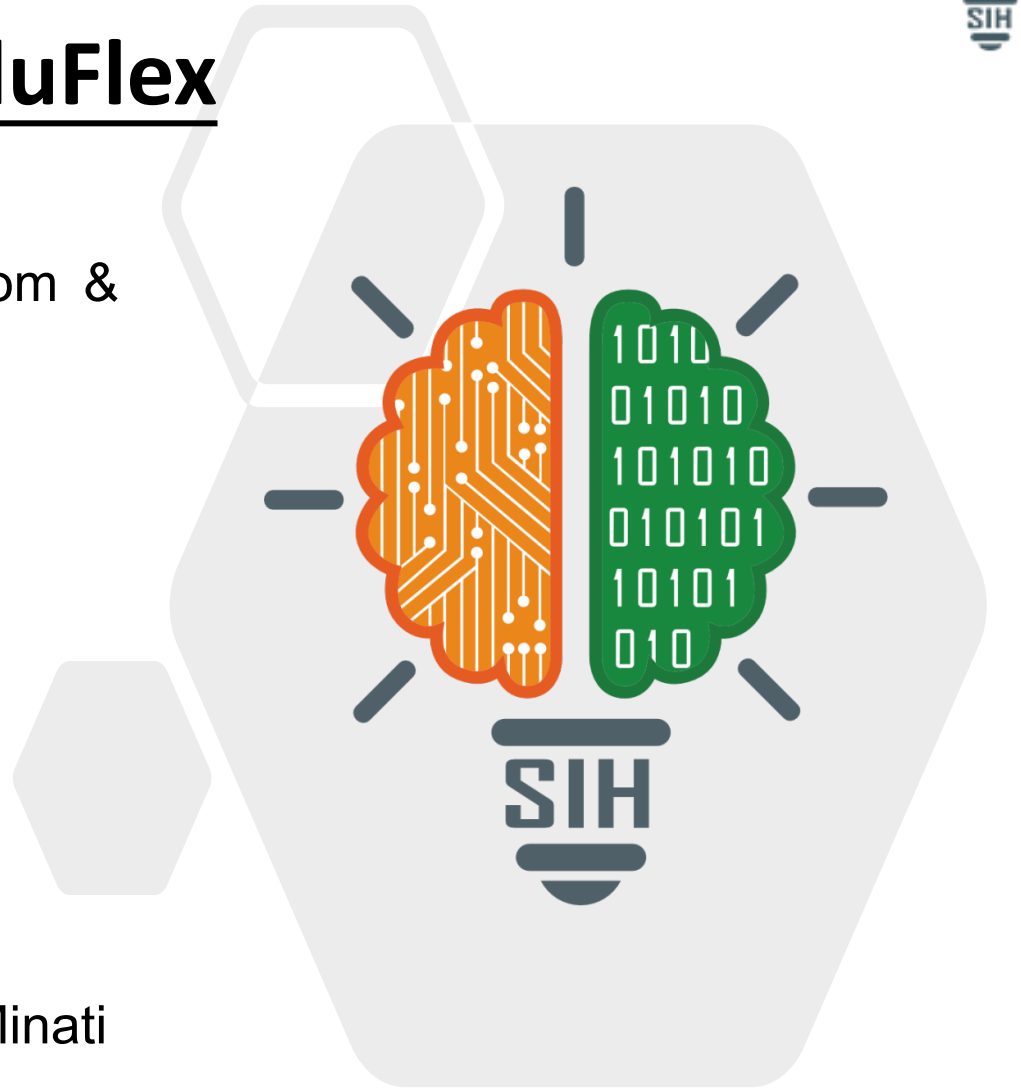
- **Problem Statement ID –**25028
- **Problem Statement Title-**Smart Classroom & Timetable Scheduler
- **Theme-**Smart Education
- **PS Category-** Software
- **Team ID-**
- **Team Name (Registered on portal) -** LLMinati



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Project Description: AI Driven Adaptive Smart Timetable Ecosystem

Proposed Solution

- A web-based intelligent timetable schedular powered by AI, ML.
- Incorporate AI-powered conflict prediction: the system alerts and proposes proactive fixes for faculty overload, room bottlenecks, and student clashes even before timetables are finalized
- Uses multi-agent system(Faculty Agent, Student Agent, Infrastructure Agent, Admin Agent) for dynamic negotiation and conflict-free scheduling.Adaptive and self-adjusting in real-time to handle leaves, class cancellations, or emergencies.

Innovation and Uniqueness

- AI-powered conversational assistant for quick scheduling queries and Eco-friendly scheduling(optimized energy and classroom usage).
- Enable student preference integration: the system factors in elective choices, preferred time slots, cross-department enrollments, and special needs accommodations, aligning scheduling to individual learning journeys.

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TECHNICAL APPROACH

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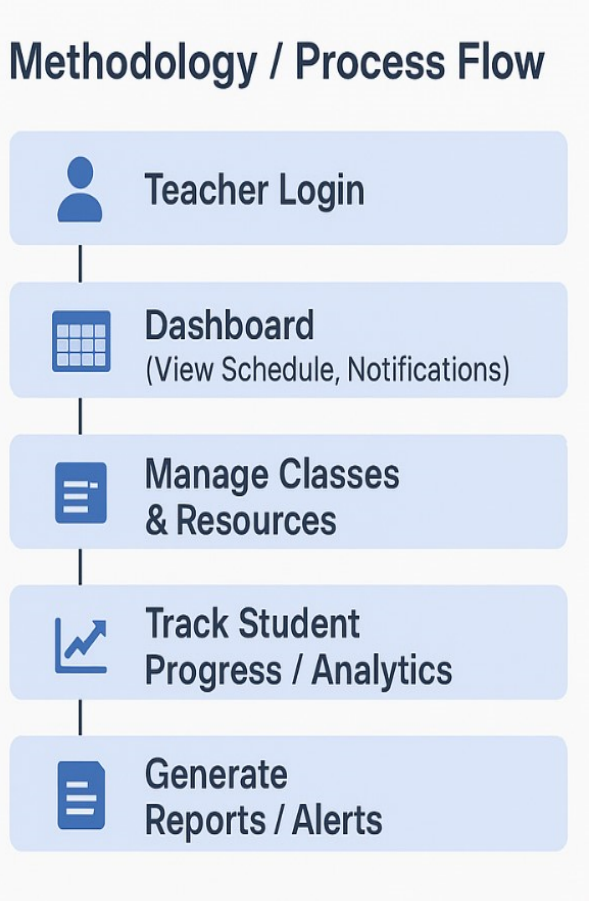
- **Technologies used**

- Frontend- HTML, CSS, JavaScript (React optional)
- Backend- Python (Flask) / Node.js
- Database- SQLite / MySQL
- APIs-Google Calendar API (optional), Notification APIs
- Tools-IDE VS Code, Git
- Hardware - Standard computer/laptop, Internet-enabled



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FEASIBILITY AND VIABILITY

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- **Analysis of the feasibility of the Idea**
- Technically feasible with current web technologies(HTML,CSS,JS,FLASK)
- Scalable for multiple users with proper database

- **Potential challenges and risks**
- Data Accuracy -Timetable conflicts or incomplete faculty/classroom data.
- User Adoption - Teachers may need time to adapt to the system.

- **Strategies for overcoming these challenges**

- Implement validation checks for input data.
- Provide a simple and intuitive UI with tutorial/support.

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IMPACT AND BENEFITS

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- **Potential Impact on Target Audience**
- Teachers- Reduced workload in timetable preparation, fewer scheduling conflicts, and better workload distribution.

- Students- Access to optimized class schedules, fewer clashes, improved learning experience.

- Administrators- Easier management of faculty and classroom resources, better decision-making support.
- **Benefits of the Solution**
- Social and Environmental- Enhances collaboration between faculty and students, improves overall academic satisfaction.Optimized classroom usage may reduce energy consumption and resource wastage.

- Technological- Encourages adoption of AI-driven tools and digital transformation in educational institutions.

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RESEARCH AND REFERENCES

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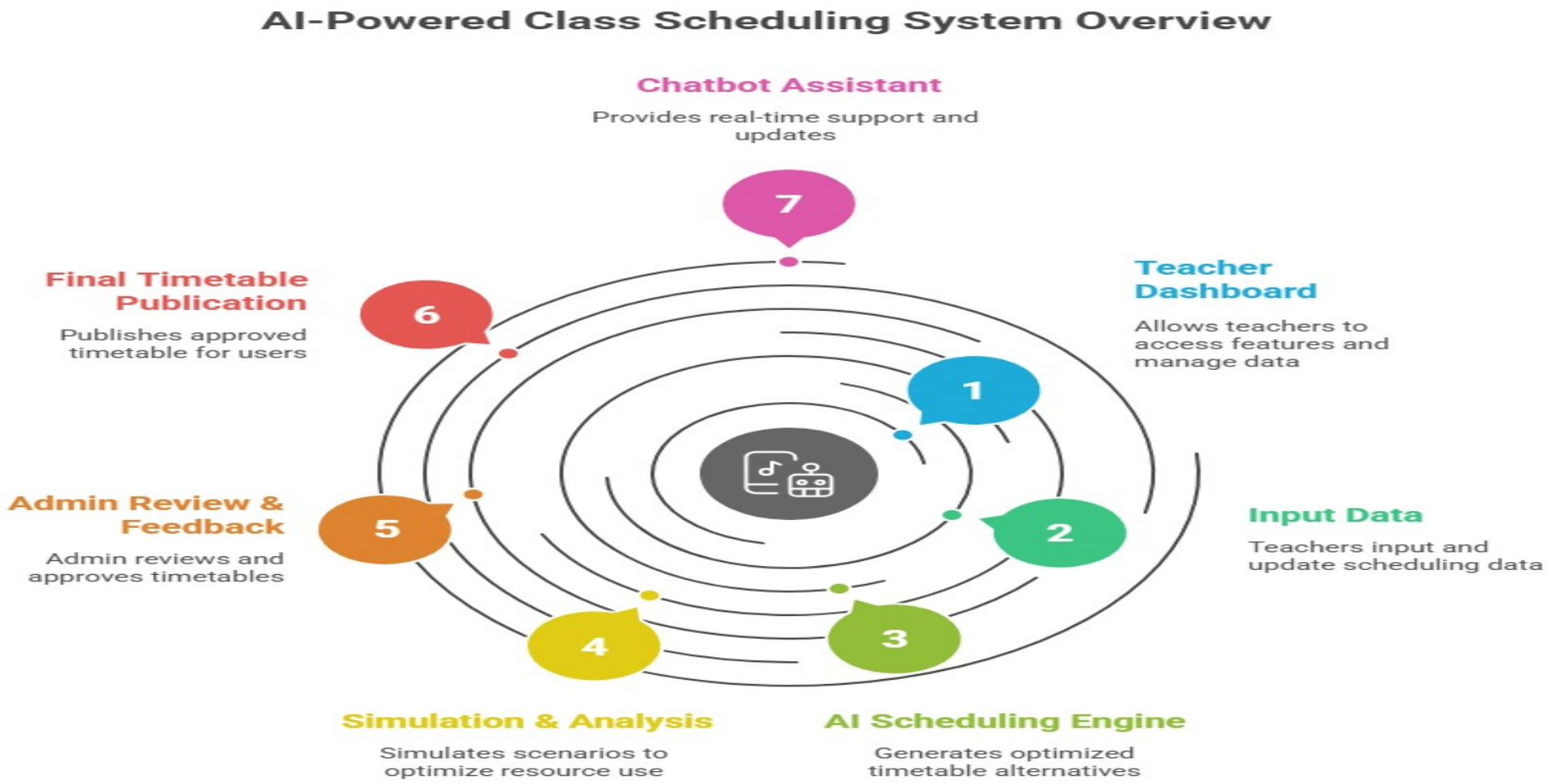
Data Flow Diagram

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