Misrimal Navajee Munoth Jain Engineering College

Department of Artificial Intelligence & Data Science

Association Of AI & DS

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Team & Problem Statement

- **Team Name : SABAS**
- **Team Leader : Om J Shah (ADS) ojsjvs123@gmail.com**
- **Team Members :**
    1. **Abhishek Tiwari (ADS)**
    2. **Padmaraju Kishore Kumar Raju (ADS)**
    3. **Shrishti Nandawat D (CSE)**
    4. **Nikunj Kumar (IT)**
- **Chosen Domain: Next-Gen Automation and Productivity**
- **Selected Problem Statement Title: AI Powered Task Automation and Workflow**

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Problem Description

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The Problem

- College bus passengers often **miss their stops** due to distractions, unfamiliar routes, or crowding.
- Lack of **real-time alerts** causes last-minute rush, unsafe exits, and confusion.
- Drivers receive no automatic feedback when a passenger is about to alight, increasing miscommunication.

Why it matters? (SDG Impact)

- **SDG 7**: Improves accessibility and safety in urban/college transport systems.
- **SDG 9 :** Encourages adoption of innovative AI-driven infrastructure.

Stakeholders affected

- **Students/Faculty:** Primary users needing timely stop notifications.
- **Drivers:** Benefit from automated alerts for smooth boarding/deboarding.
- **College Administration:** Gains data for transport planning, cost control, and sustainability reporting.

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Proposed Solution

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Solution Overview

- **AI Mobile app + on-bus hardware** linked to a cloud server
- Passengers set their **destination stop** in the app.
- System sends a **5-minute pre-drop alert** to the passenger (phone vibration, push notification).

Innovation & AI Integration

- **AI-based ETA prediction** using live GPS, historical traffic patterns, and speed analytics.
- Adaptive alert timing—system adjusts notification window if the bus is early/late.
- Smart route optimization for multi-stop trips.

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Technology Stack

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Core AI/ML Techniques

- **Passenger Behavior Analytics** – Apply **classification models** (e.g., decision trees, random forest) to predict peak boarding times and improve scheduling.

- **Real-time Traffic Prediction** – Integrate external traffic APIs with a **reinforcement learning model** to dynamically adjust ETA and alert timing.

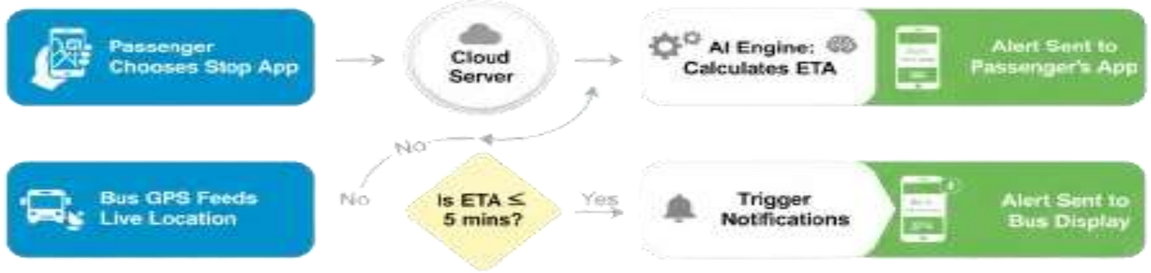
Front-end & UI/UX

- **Vibe Code tools like base44** → Fast, interactive dashboards & reporting UI
- Clean interface for destination selection, trip tracking, and alert preferences.
- Responsive design for web & mobile accessibility

Backend & Data Handling

- **Node.js / Firebase** for real-time communication.
- **Firebase Realtime DB / MySQL** to store routes, stops, attendance, and passenger logs.
- Secure APIs with end-to-end encryption for privacy.

Workflow



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Expected Output & Impact

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Expected Output

- **Accurate, timely alerts** to passengers and drivers.
- Automated **attendance** and **missed-stop reports** for administration.
- Real-time dashboards for route and punctuality monitoring.

Scalability & Beneficiaries

- Deployable across **multiple buses, routes, and institutions**.
- Beneficiaries include **students, staff, drivers, transport managers**, and indirectly the environment.

Impacts (Aligned to SDGs)

- **SDG 9:**Promotes AI adoption in public transport.
- **SDG 13**: Minimizes fuel waste through better scheduling.
- **SDG 11**:Reduces human error and travel stress.

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References & Research Background

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Existing solutions/ Research Works

- Google Transit ETA algorithms, Uber/Lyft drop notifications, and city bus tracking apps.
- Academic research on **GPS-based passenger alert systems** and **ML-driven ETA models**.

Our Novelty/ Unique Approach

- Cost-efficient architecture designed for easy adoption by educational institutions.
- **AI-powered ESG reporting** for sustainability tracking—rare in campus transport.
- Combines **multi-modal alerts** (push + audio + LED) with **college-specific needs**.

Our Novelty/ Unique Approach

- **Multimodal Alert Mechanism:** Integrates **audio, visual, and haptic signals** ensuring accessibility for all passenger
- **Campus-Specific AI Integration:** First system to blend **real-time passenger drop alerts with AI-powered ESG reporting** in a college transport setting.