Team Details

a. Team name: InnovateX
b. Team leader name: Suvolina Mukherjee
c. Problem Statement: Open Innovation

Brief about your solution and problem statement addressing

Urban areas struggle with delayed garbage collection, overflowing bins, and lack of tracking.

Our solution Smart Waste Management System (SWMS) uses IoT + Google Technologies to monitor bin levels, optimize collection routes, and speed up waste management.

The system includes:

1. Smart sensors in bins sending live fill-level data.

2.Google Maps–powered route optimisation.

Opportunities

a. How different is it from any of the other existing ideas?

b. How will it be able to solve the problem?

a. Real-time monitoring instead of manual checking.
Automated route optimisation instead of fixed routes.
Mobile app for public participation.
Data analytics for long-term planning.

b. Prevents overflowing bins.
Reduces fuel usage and time by using optimized routes.
Helps the municipality track trucks live.
Faster response to waste complaints.

List of features offered by the solution

Smart bin fill-level detection.

Google Maps–based shortest route planning.

Firebase real-time dashboard for administrators.

AI alerts for bins nearing full capacity.

User complaint portal.

Driver mobile app with daily assigned routes.

Weekly analytics on waste patterns.

Google Technologies used in the solution

Google Maps Platform (Route Optimization, Live Maps, Geolocation API).

Google Cloud IoT Core (Sensor connectivity).

Firebase (Database, Authentication, Hosting).

Google Cloud Functions (Automated alerts & backend logic).

Process flow diagram or Use-case diagram

Sensor detects bin fill level

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Data sent to Firebase using IoT Core

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System analyzes which bins are full

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Google Maps API generates optimized route

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Driver receives updated route on mobile app

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Admin dashboard displays live status

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Citizens report issues → Logged in system

Wireframes/Mock diagrams of the proposed solution (optional)

Admin dashboard mockup.

Mobile app route screen.

Complaint submission page.

Architecture diagram of the proposed solution

IoT Sensors → Google Cloud IoT Core → Firebase DB

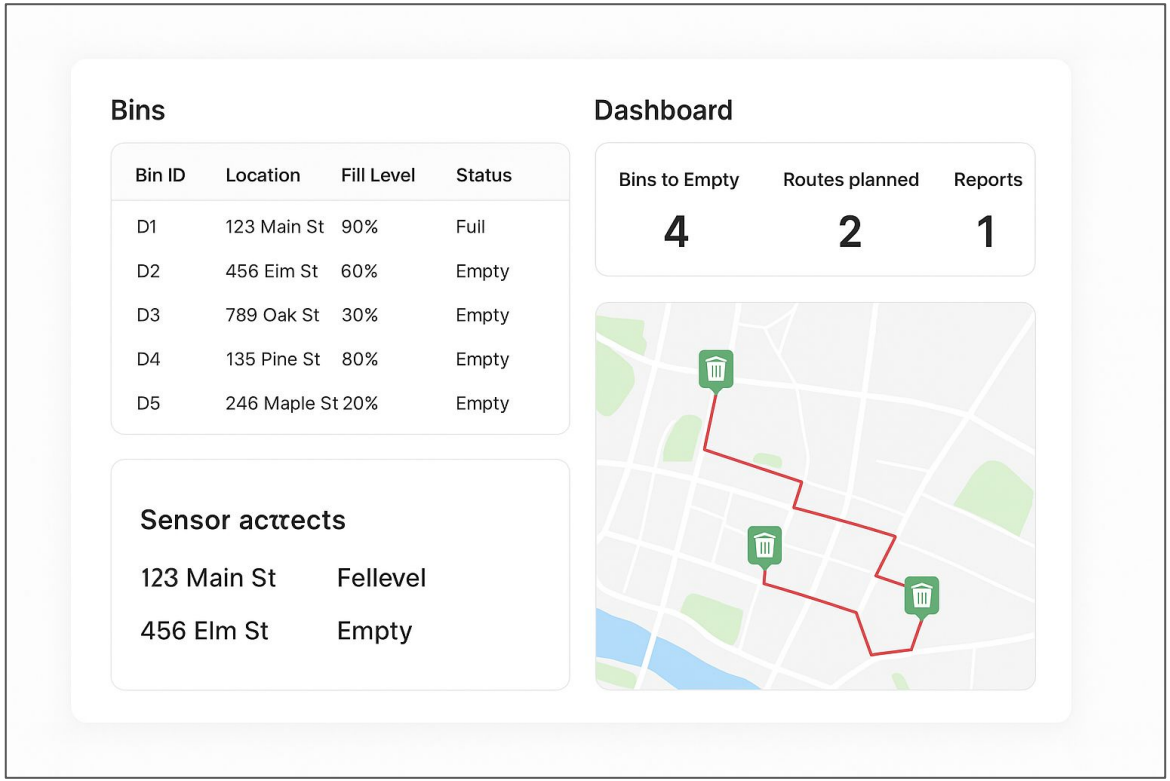
Firebase → Dashboard (Web App)

Route Optimization → Google Maps API

Cloud Functions → Notifications

User App ↔ Firebase

Snapshots of the MVP



Additional Details/Future Development (if any)

AI-based prediction of trash generation.

Integration with recycling centers.

Separate routes for wet/dry waste.

Smart notifications for households.


MISSION BRIEFING
MISSION TARGET: IMPETUS
Boss:
Listen up, rookie. Your target is this operation. Check it.
IMPETUS
Google Developer Group

Thank you!