प्रयत्न 3.0

ATTEMPT <> INNOVATE <> SUCCEED

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Problem Overview

TitanClean
Guardians of City Cleanliness
by Koding Titans

Problem Title

TitanClean – Citizen Waste Reporting & Cleanliness Reward App

Domain - Smart City | Civic Technology | Environmental Management

Background and Context

- Urban areas face issues like uncollected waste and overflowing bins due to limited monitoring.
- Delayed reporting and low citizen involvement result in poor sanitation and health risks.

Stakeholders Affected

- Citizens & Local Communities – Reporting and participation
- Municipal Authorities – Monitoring and response
- Waste Collection Agencies – Execution and cleanup
- Environmental & Health Departments – Sanitation oversight

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Problem Statement

- ***Urban cities generate ~60% of total solid waste, yet monitoring remains inefficient***
- ***~40–50% waste collection struggles between time, cost, and coverage***
- ***Municipal bodies lack real-time data for ~70% reported waste issues***
- ***Need: A solution that empowers both citizens and authorities to enable timely cleanup and responsible waste management based on real-world conditions***

Existing Methods or Systems

Current waste management relies on manual complaints and basic mobile applications where citizens report issues after waste has already accumulated.

- Manual complaint registration
- Photo-based reporting apps
- Fixed-route waste collection
- Informal scrap collection (offline)

Limitations and Challenges

These systems fail to address waste problems proactively and efficiently due to:

- No real-time waste monitoring
- No prediction using past data
- Low citizen participation (no incentives)
- Repeated waste overflow at same locations

One Click Towards Cleanliness.

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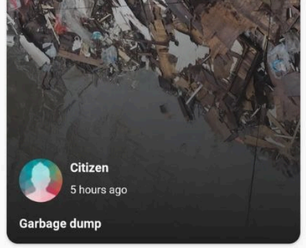
Proposed Solution



Citizen Waste Reporting

01

Enables citizens to capture and report waste issues using photos and live location for faster action.

AI-Based Waste Prediction

02

Analyzes past cleanup data to predict waste overflow and trigger proactive cleaning.

Waste as a Resource System

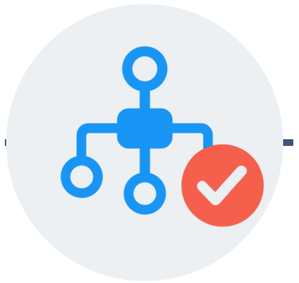
03

Allows users to share, exchange, or sell recyclable waste through a digital platform.

Real-Time Status Tracking

04

Shows live complaint status (reported, in-progress, resolved) for transparency and trust.



Priority-Based Cleanup Routing

05

Automatically prioritizes waste locations based on severity, location, and time.

Duplicate Complaint Detection

06

Uses AI and location matching to reduce repeated reports of the same issue.

Citizen Reward System

07

Rewards users with points for valid reports and responsible waste contributions.

Municipal & NGO Dashboard

08

Provides authorities and partners with analytics, heatmaps.

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Technical Approach

Next.js
Web Development

ML Model
Olama

MongoDB
Database

Gemini API
API

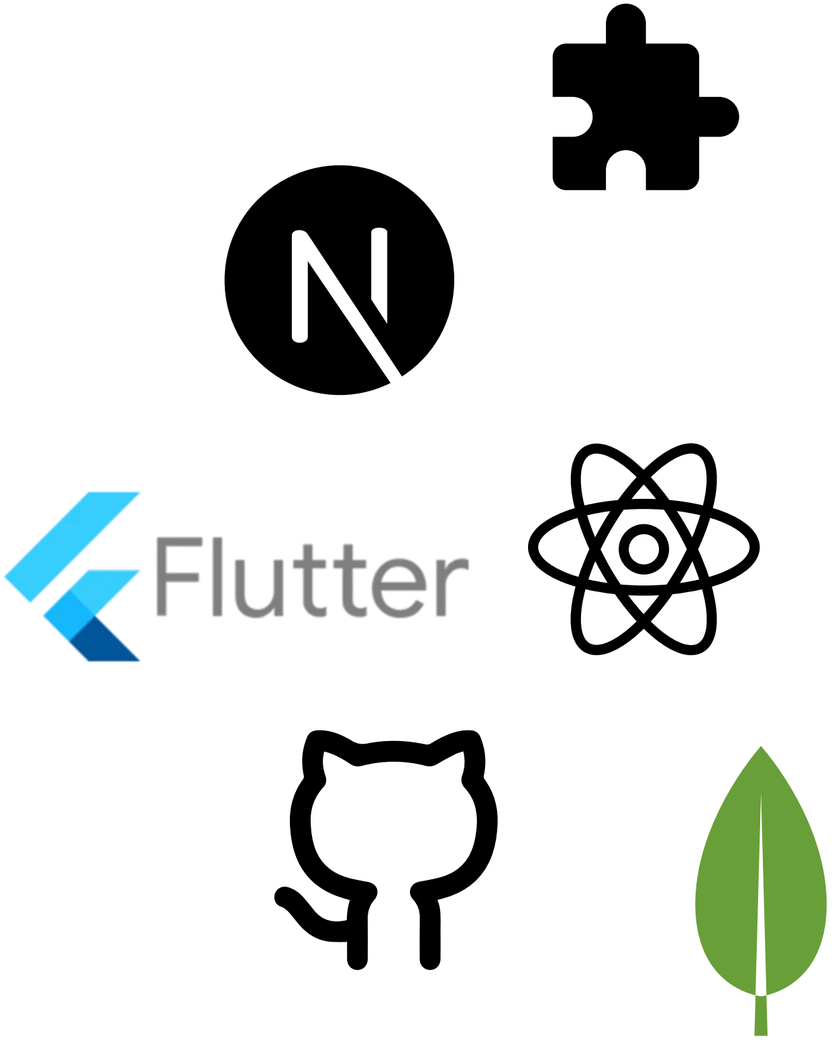
Git,GitHub
Version Control

Customised Authentication

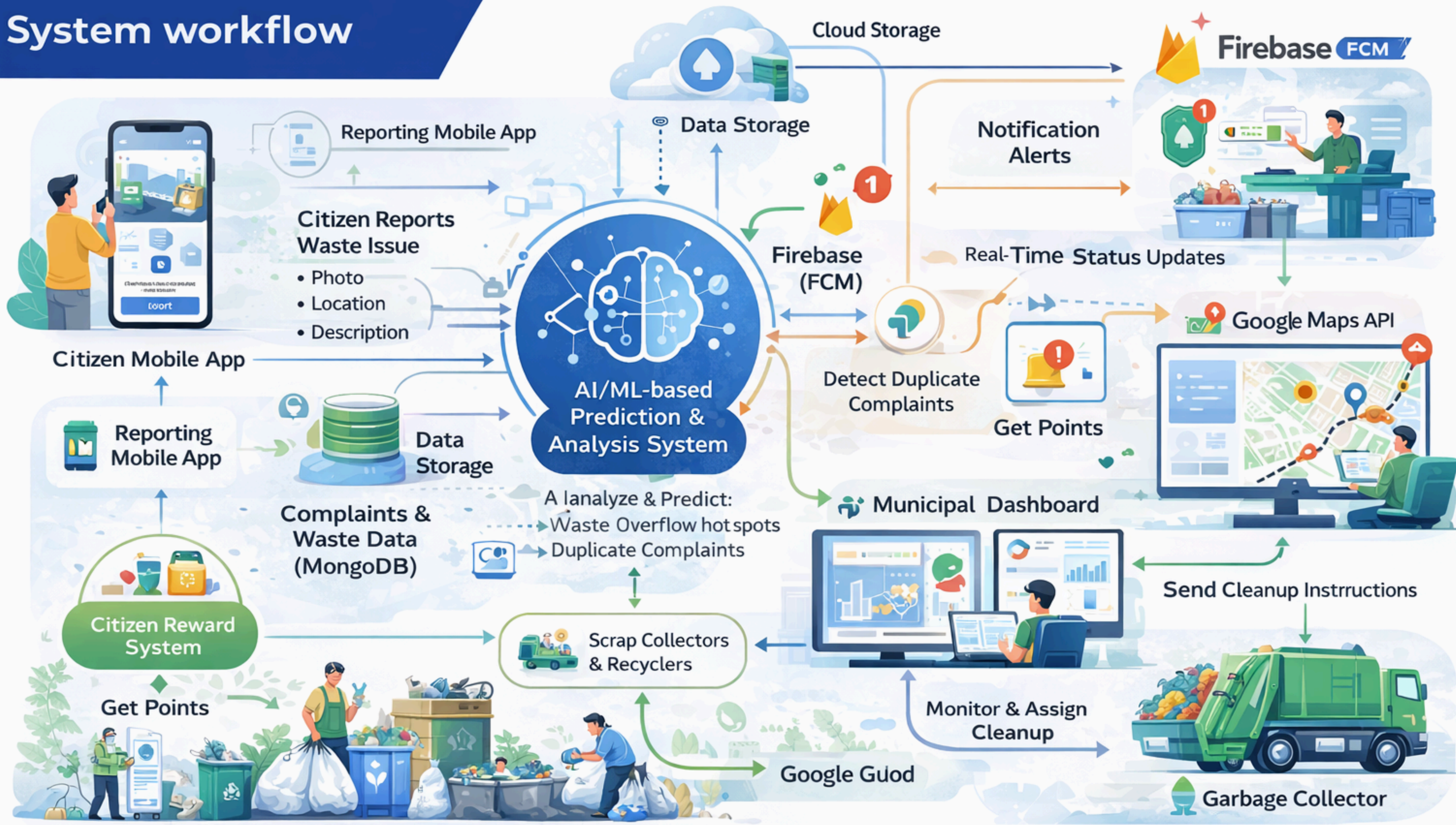
Flutter
Cross-platform Mobile application

Prisma Schema
ORM High level overviewer

Firebase (FCM)



System workflow



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Feasibility and Impact

Practical Feasibility

- Uses existing mobile infrastructure (smartphones, GPS, internet)
- Integrates with current municipal workflows
- Built using proven technologies (Flutter, Next.js, MongoDB, Firebase)
- Can be deployed city-wise without major changes

Expected Impact

- Faster waste cleanup through early reporting and prediction
- Higher citizen participation via rewards and transparency
- Reduced health and sanitation risks
- Better recycling rates by treating waste as a resource
- Improved accountability of authorities

Scalability

- Easily scalable from wards → cities → states
- Cloud-based architecture supports high user volume
- AI models improve with more data over time
- Encourages long-term sustainable waste practices
- Supports NGO and private recycler integration

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Implementation Plan

MVP Development

Build the core mobile app with waste reporting, photo upload, and location tagging to validate the concept quickly.

AI & Prediction Module

Develop AI models to detect duplicate complaints and predict waste overflow using historical cleanup data.

Pilot Deployment & Scaling

Launch a pilot in selected areas, collect feedback, optimize performance, and prepare for city-wide expansion.

Backend & Data Integration

Set up backend services with MongoDB, APIs, and cloud storage to manage reports, users, and waste data securely.

Notifications & Rewards System

Integrate real-time notifications and a reward mechanism to encourage active citizen participation.