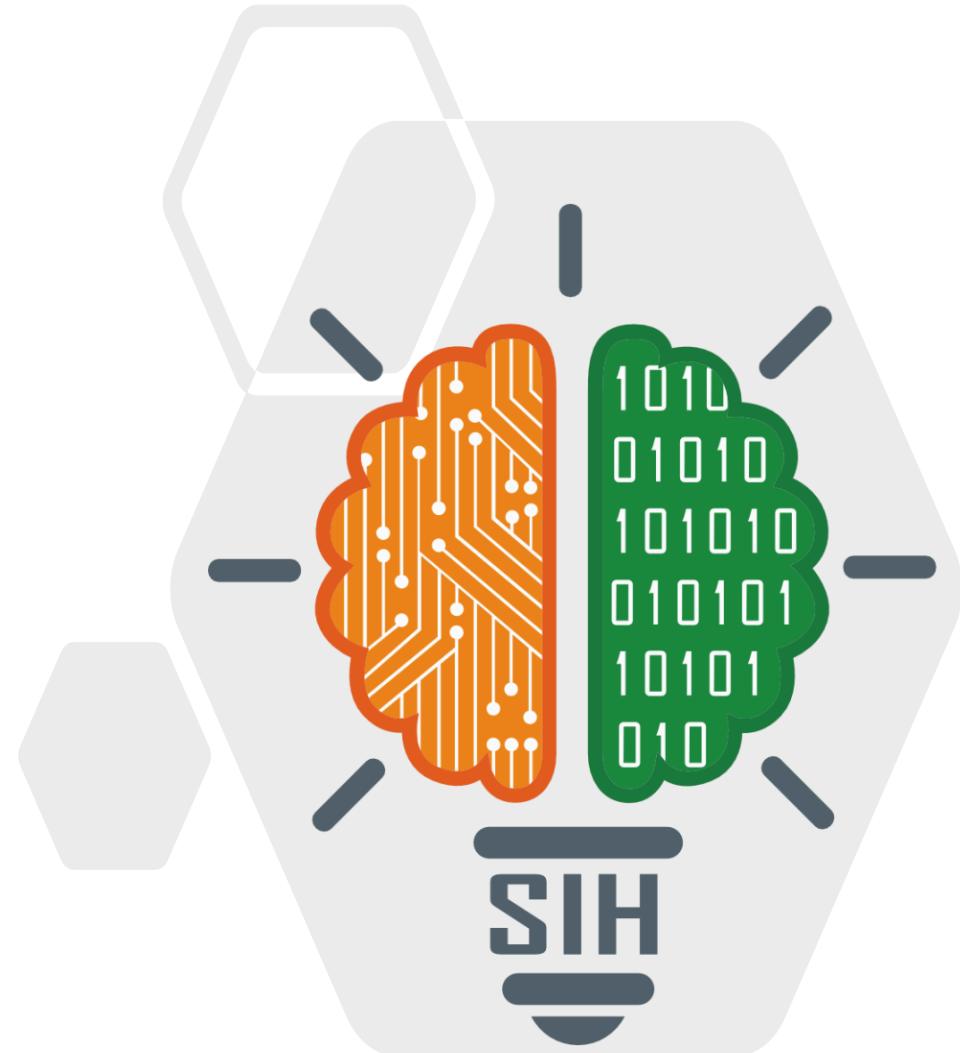


- Problem Statement ID-25060
- Problem Statement Title-Real Life Solution  
For Waste Management.
- Theme- Clean & Green Technology.
- PS Category-Software.
- Software/Hardware Team ID-56
- Team Name (Registered on portal)-



## Training & Awareness

- 1) Citizens & Waste Workers **Training**, Recycling at home, Hygiene and Safety.
- 2) Awareness of Disease Spread By Improper Waste management.
- 3) After Completion Give Quizzes and Get Certified also rewards.

## Smart Mapping

- 1) Live Tracking of Waste Collector Vehicle, Recycling Centers Routes on map.
- 2) **Alert (on mobile)** if Waste Collector vehicle reaches **near 100m**.
- 3) Track nearby Dustbin, Scrap shops, Upload **Geo-Tagged** Photos of dumping site.
- 4) **Color-Coded Dustbin** on map (*Green=Available, Yellow=Half full, Red=Full*) .
- 5) Areas with high waste generation show in red (for planning extra truck&bins).

## AI Prediction

- 1) **Route Optimization** for Waste Collector Vehicles (reduce fuel & time).
- 2) **AI Based Prediction** for next Truck Arrival (if Missed).
- 3) **AI Based Waste Sorting Robots** (*for large waste Centers*).

## Recycle & Reuse

- 1) **Biodegradable Waste:** Composting, Use for Biogas-Plants.
- 2) **Non-Biodegradable:**
  - i) Plastics Bottles=>Granules=>Tiles, Benches, **3D Printing Filament**.
  - ii) Metal & Glass=>Scrap=>Remelting=>New Product.
- 3) **Black Soldier Fly Larvae (BSFL):** That decomposes Organic Waste into Compost & Protein rich Biomass by consuming it.

## Unique Features :

### ✓ Live Tracking of Garbage Truck:

- Active only between 9:00 AM-1:00PM with real time monitoring, Alert on mobile .

### ✓ Smart Mapping System:

- Shows nearby dustbin and scrap shops (plastic, metals, e-waste, etc), Recycling centre.

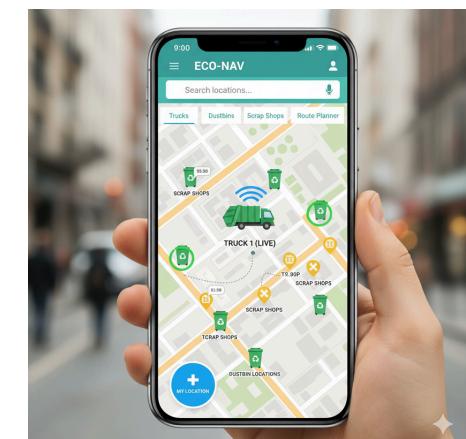
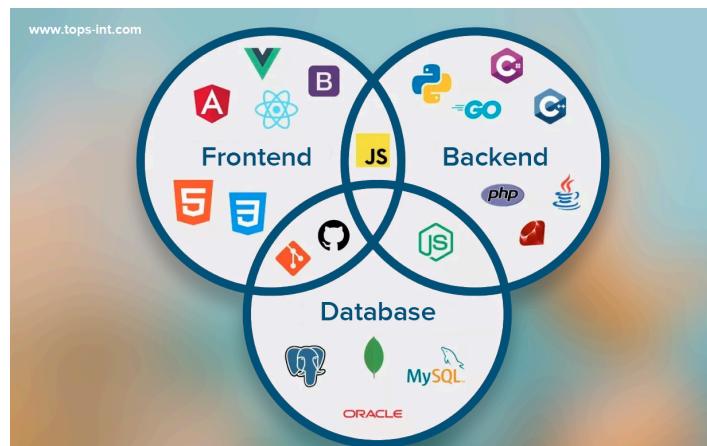
### ✓ Geo-tagged photos of Illegal dumpings :

- Citizens can report illegal dumping (*upload photo , description, location*)and also track complaint Status.

## Technology Used:-

- ✓ Frontend: HTML, CSS, JavaScript
- ✓ Backend: Python (Flask)
- ✓ Database:MySQL
- ✓ Integration :Google Maps API

## Prototype Video



### Feasibility:

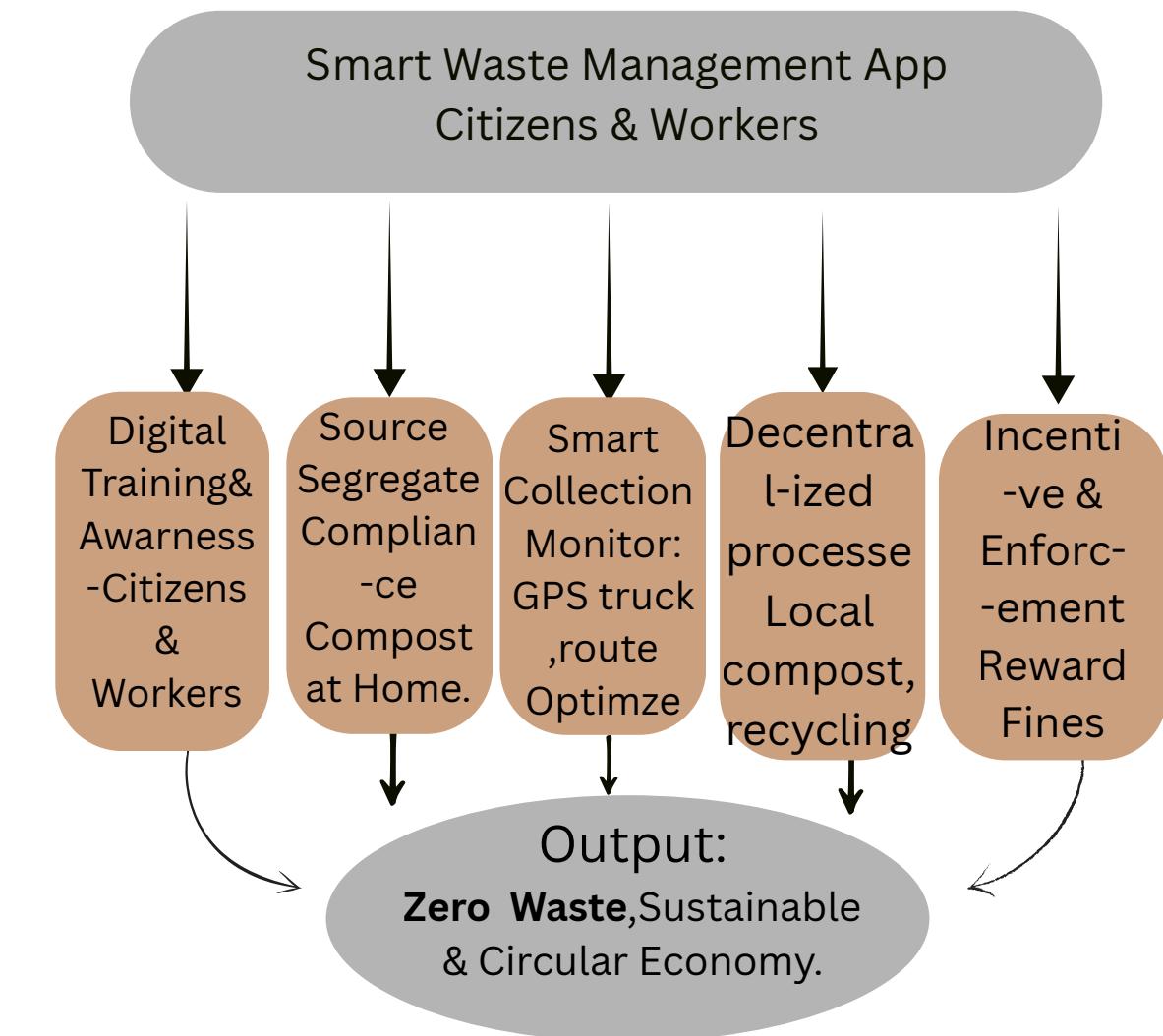
- » **Scalable Digital Platform** -Mob + Web App
- » **IOT & AI Enabled**-Smart bins,GPS tracking
- » **PPP & CSR Funding**- Goverment Schemes
- » **Revenue Generation**-Compost Sales,Recycling

### Challenges and risks:

- » **Digital Divide** -Limited Smartphone & Internet
- » **Data Reliability Issues** - False Reporting incomplete Geo-Tagging.
- » Infrastructure Gap-Limited

### Strategies to Overcome:

- » Offline Mode-Auto -Sync When online.
- » **AI + Manual Verification** -Reduce False Complaints / Data Errors
- » Govt. Incentives , Local Entrepreneurs.



## Impacts:-

- ✓ **Training & Awareness**:- Health and Safety, Improved Community Engagement, Behavioural change at Scale.
- ✓ **Recycling Techniques** :- Less Landfill dumping Biotech Innovation , Green Recovery, Circular economy.
- ✓ **Scheduled Pickups**:- Cleaner Surroundings , less overflow of garbage , Healthier Environment.
- ✓ **Garbage Truck Alert System**:- Timely Collection , reduced littering , Smoother city Operations,
- ✓ **Smart Mapping**:- Transparency in Collection , Reduced Corruption, Proximity Alerts, Real time Tracking.

## Benefits:-

- ✓ **Efficient Waste Management** :- Faster , Smarter Collection with reduced cost.
- ✓ **Public Health Improvement**:- Less disease spread from Waste management.
- ✓ **Economic Returns** :- Revenue from recycling and Compost Production.
- ✓ **Time & Fuel Savings** :- Optimized Garbage truck routes with Alert System & Tracking.
- ✓ **Community Empowerment**:- Citizens become active contributors , not just waste producers.

- ✓ Research done on **Field Understanding** of Recycling Techniques and **Monitoring of Garbage Truck** on Map  
(Field Detail:Nashik Waste Management pvt Ltd).



**Compactness Termocol**

**Compost Production Area**

**Moisture Management Process**

- ✓ Nashik Waste Management Website :- <https://nwmpl.co.in/>
- ✓ United Nation Development Programme (UNDP) :- <https://www.undp.org/>
- ✓ Central Pollution Control Board (CPCB):- <https://cpcb.nic.in/>
- ✓ Trinetra Wireless("Waste Management Vehicle Tracking"):- <https://www.trinetrawireless.com/industry/garbage-vehicle-tracking-system-waste-management/>