VARJYASARATHI.AI

No Waste, Better City

going ZERO WASTE

Issues- Waste collection systems

- Negligence in waste segregation at source
- No monitoring agent to track the movement of wastes
- Recycling isn't done seriously
- Burden on authorities to collect waste timely
- Lack of Awareness

POLLUTION

Life of Plastic: India its own worst enemy in tackling polymer pollution; here is how

The country has tried to dilute its own legislation on dealing with plastic pollution in the past 6 years

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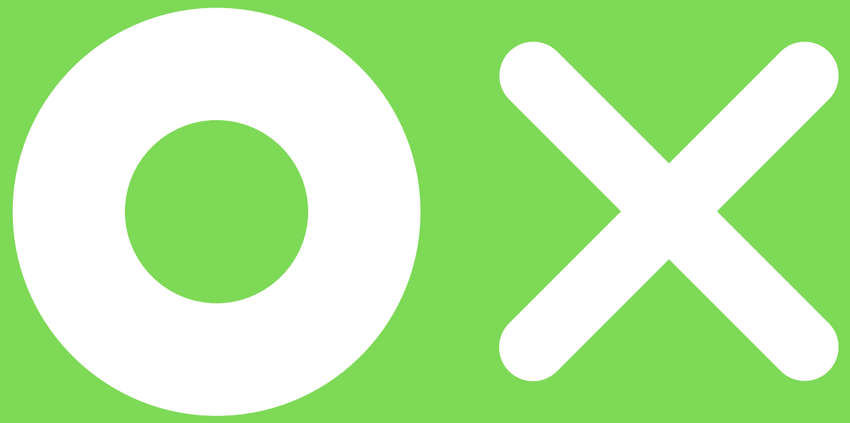
By DTE Staff

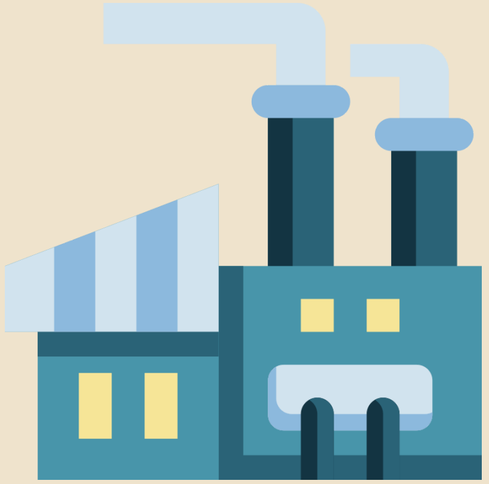
Our solution



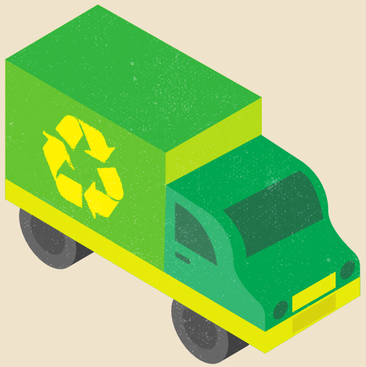
Our Solution

Provide segregation prompts

VARJYA SARATHI

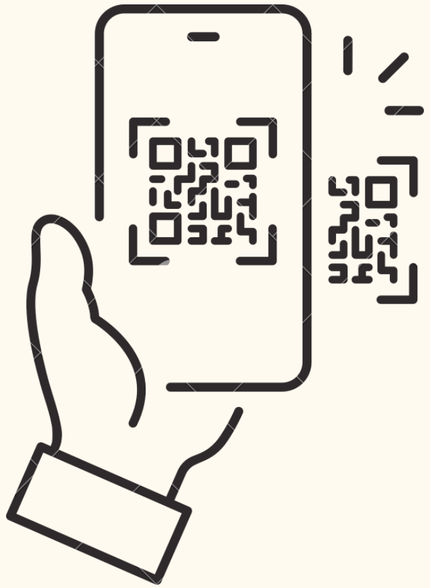


Platform to ship waste to recycling industries

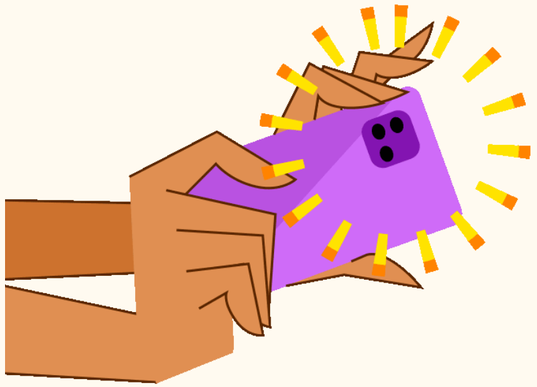


Facilitate waste pickup

4-step trash drop process



Scan the QR on dustbin



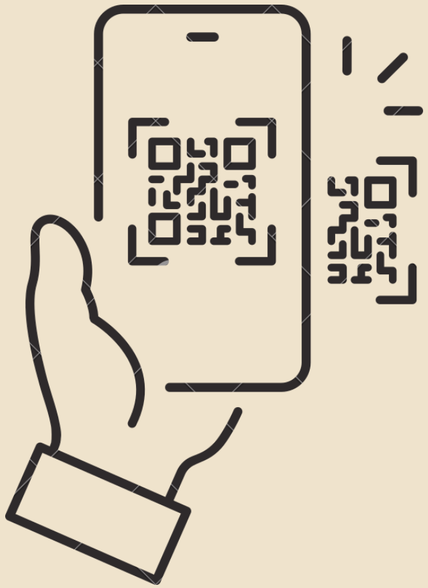
Take a picture of trash

Identification and prompts

Drop the trash

3 Step Trash Clearance

Login to App to check dustbins by priority



Scan the QR on dustbin

Pickup the trash

Take a picture of empty dustbin for verification

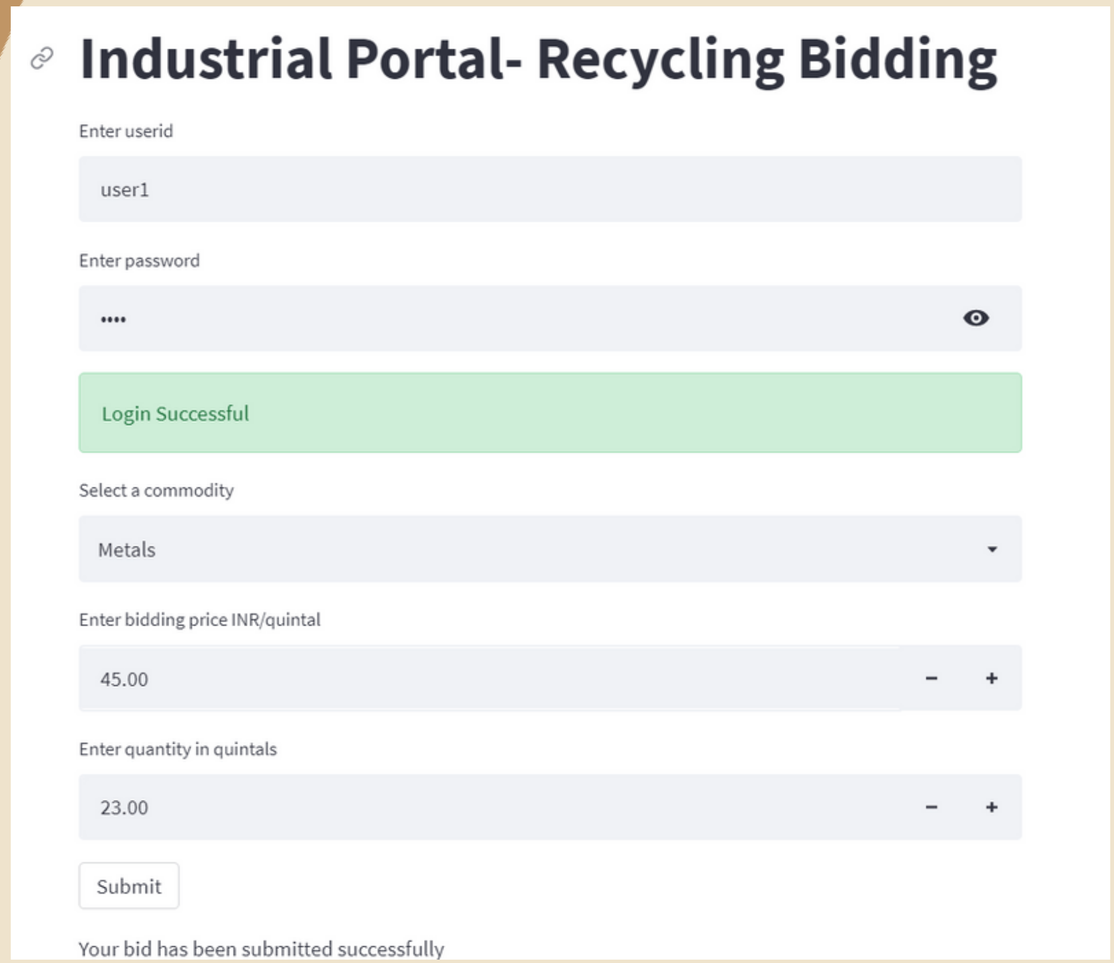
Bidding- for Waste purchase

Making Recycling-

1. **Competitive**- Industries buy waste at the best value
2. **Rewarding**- Monetary compensation to users who provide trash
3. **Lifelong**- Making it a habit for lifelong practices

PRESENTING-

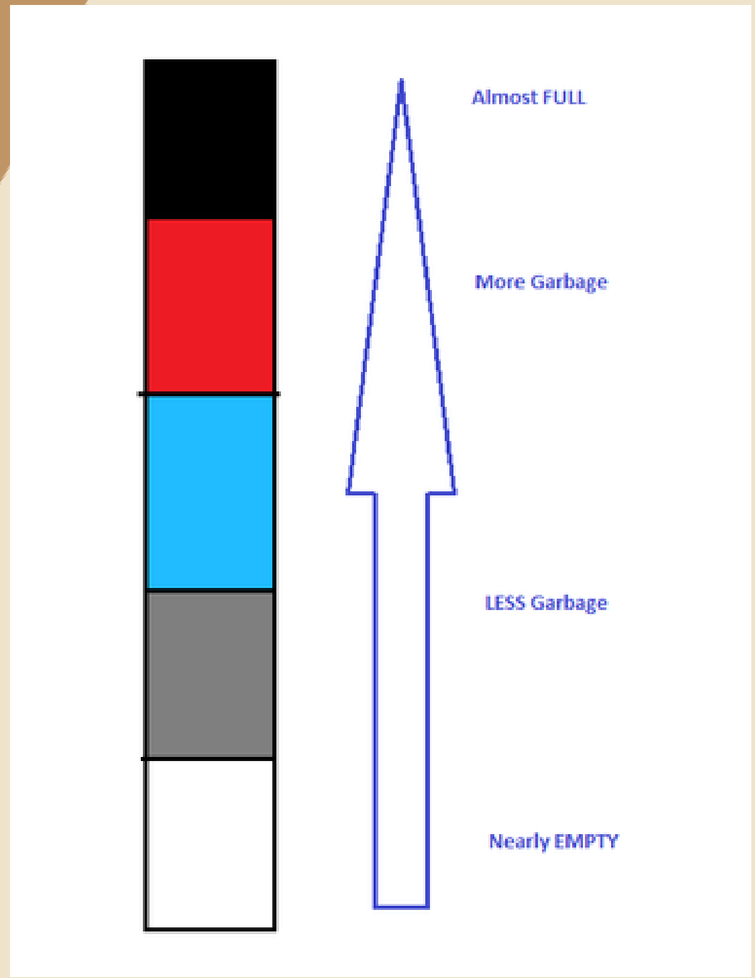
A Web Portal for Bidders



How it Works?

1. User Authentication
2. Make a Bid for Trash Type, Price and Quantity
3. Wait for the Bid period to end
4. Get instant results

Introducing-
The R-ROD™



What is R-ROD™?

R-Rod is a multi coloured rod/sticker divided into five categories, which will indicate the level of garbage in the bin. The user needs to check the colour and enter it during photo upload. Then this will be sent to our database and a report of this will be sent to the local municipal department. This will help in prioritization of garbage collection to the bins already filled.

Each colour ranging from Black to White (Completely filled to empty) has a unique weight score which determines the current level of trash in dustbin.

Score= Σ all reported scores / Σ no. of reports

Let's go Technical- App and ML

Machine Learning-

1. For Recyclable vs Organic Classification

Model used- **Xception**, **MobileNetV2**, **Novel CNN**

Results- Best results using Transfer learning with Xception layer with 200x200 px images.

	precision	recall	f1-score	support
O	0.78	0.97	0.86	1401
R	0.94	0.65	0.77	1112
accuracy			0.83	2513
macro avg	0.86	0.81	0.82	2513
weighted avg	0.85	0.83	0.82	2513

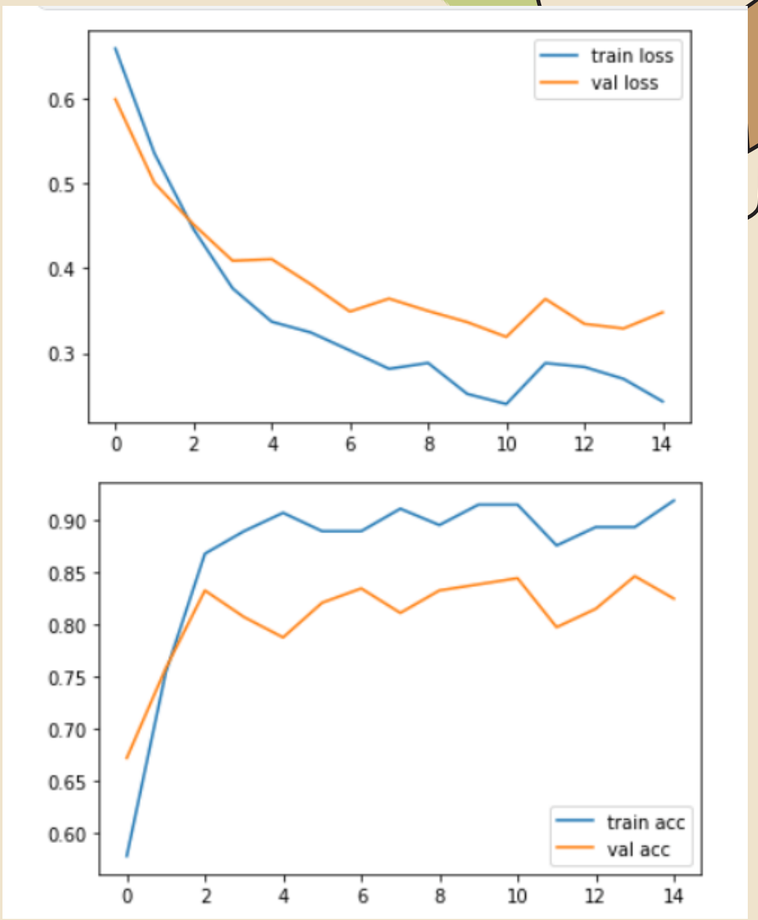
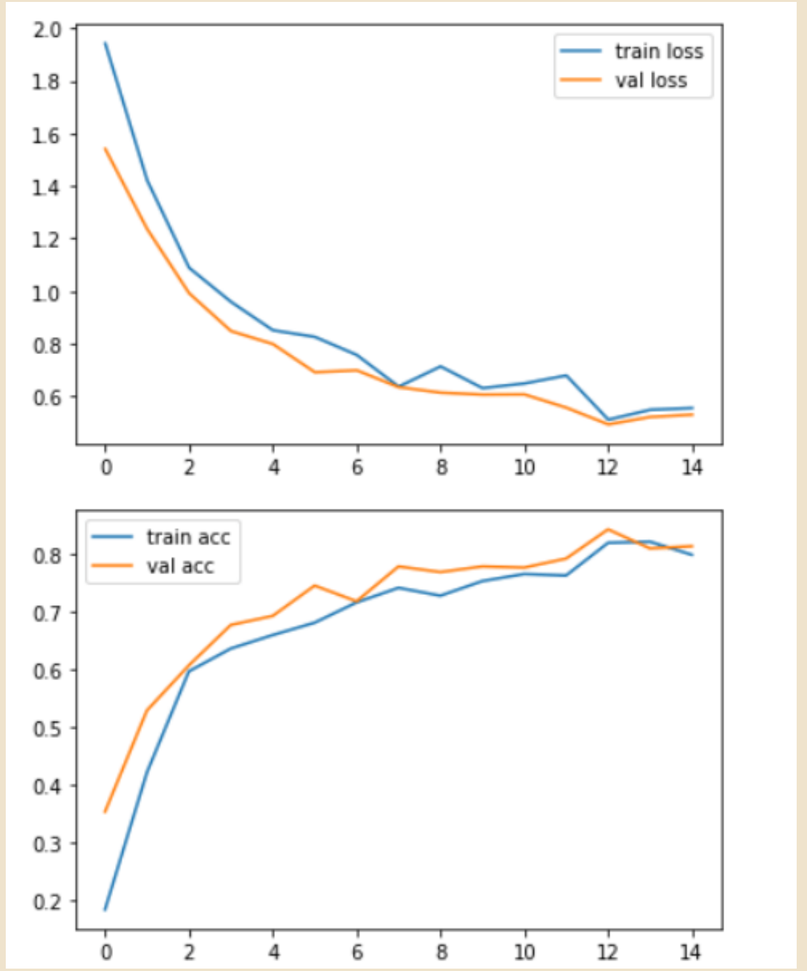


Fig. Performance metrics of Xception model

2. Multi-Class Classification

Dataset- TrashBox with 17,785 images
Classes- Paper, Cardboard, Plastic, Metals, Glass
Accuracy- 89% overall
Model - Transfer learning with EfficientNet-Lite0



3. On-Street waste detection using CCTV

Dataset-Custom sourced (120 and counting)
Classes- 2 (Clean streets and waste-filled streets)
Model - Transfer learning with VGG19

Let's go Technical- App and ML

App Features-

1. Made with Android Studio
2. User authentication is done using Firebase (Database)
3. Cloud Firestore (A real-time database is used) for storing details
4. Stores **ML models in-app** for faster inferencing and **offline classification** capability
5. **Multiple Language support** such as Odia, Hindi etc.
6. **Google Maps integration** to find nearby dustbins.

WebApp (Only for marketplace)-

1. Built using streamlit framework.
2. Enables people to bid in real time for different commodities.

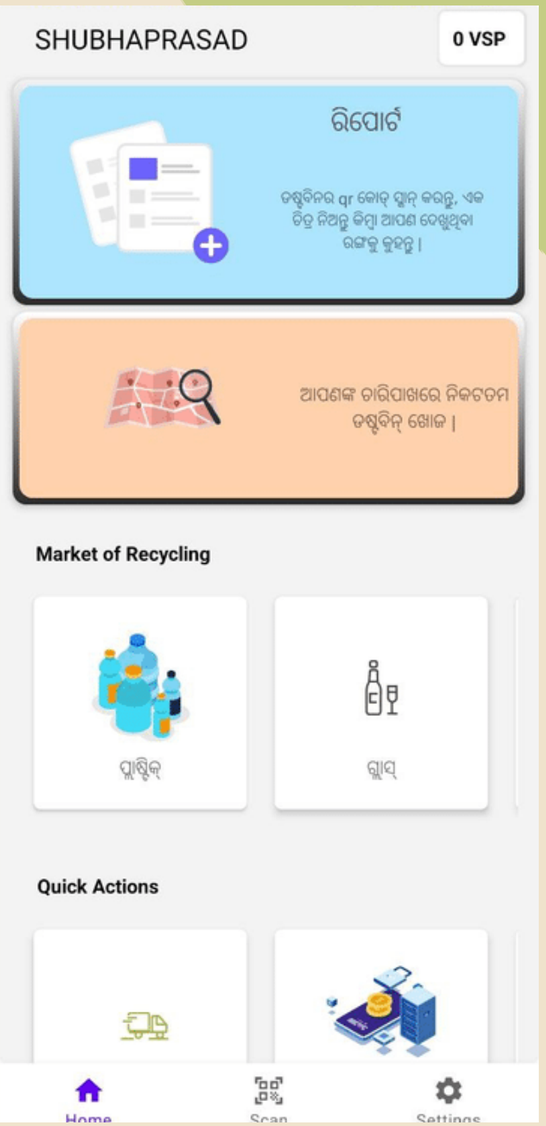
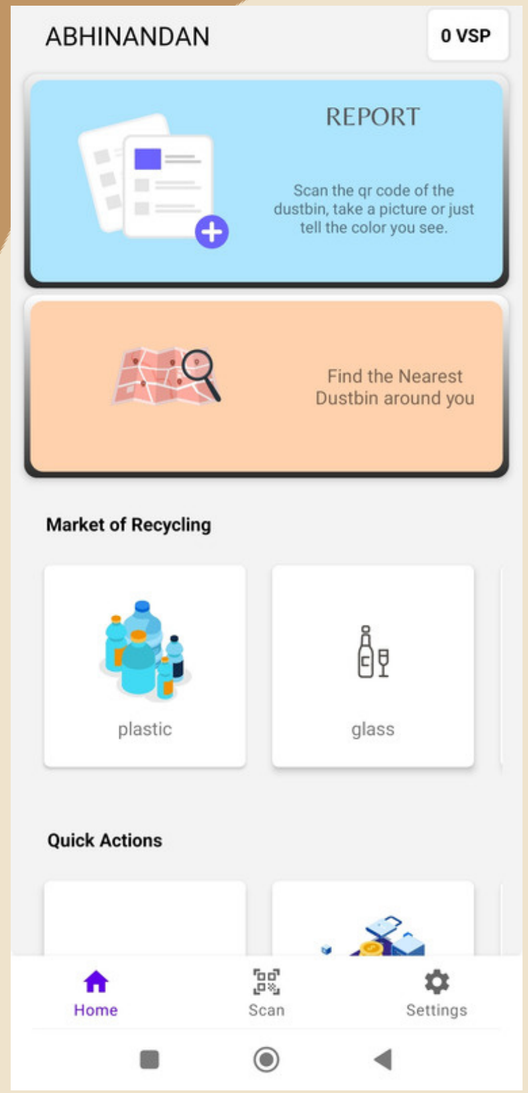
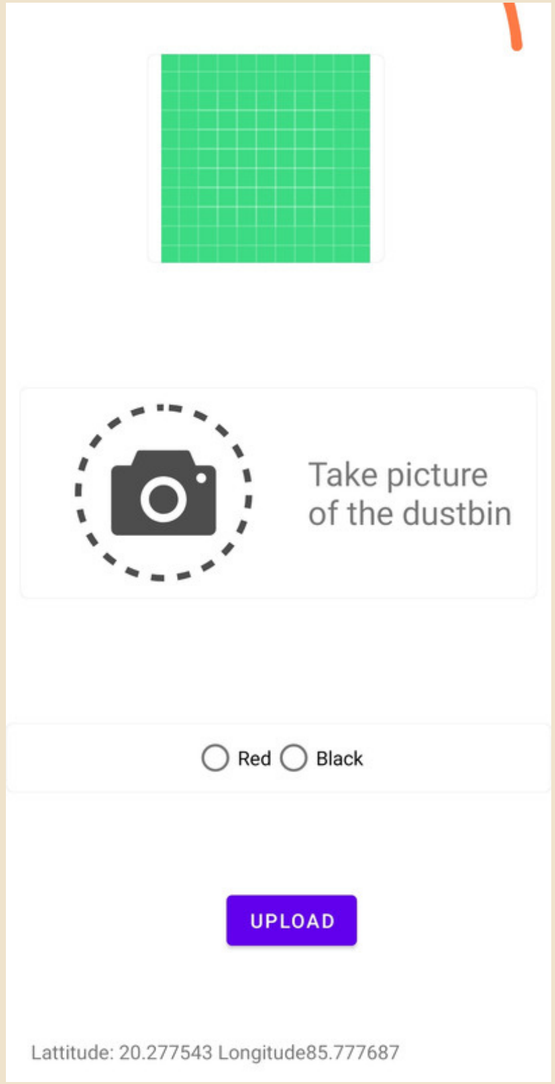
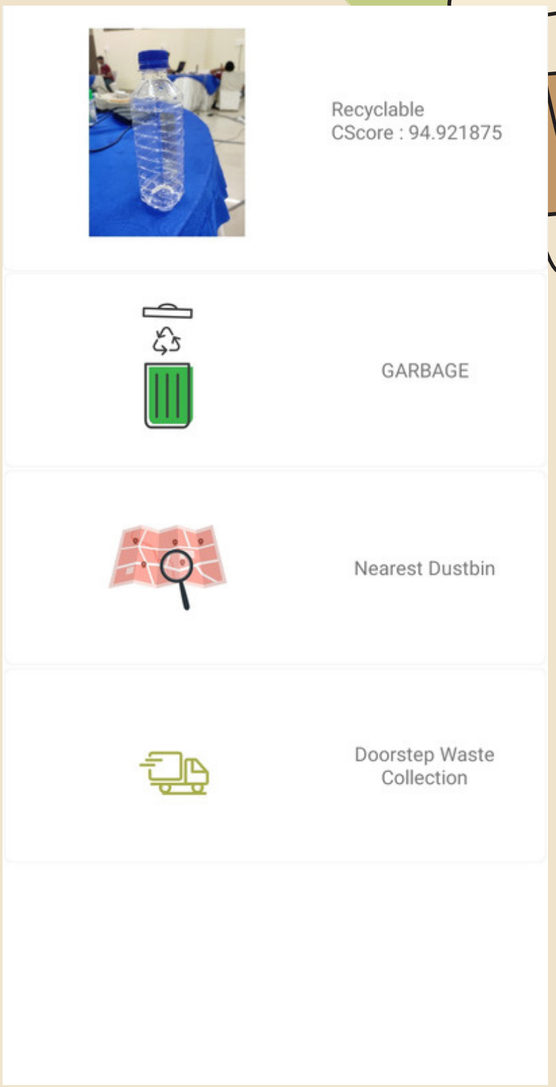


Fig. App in Odia mode

Let's go Technical- App Screenshots







Let's talk business

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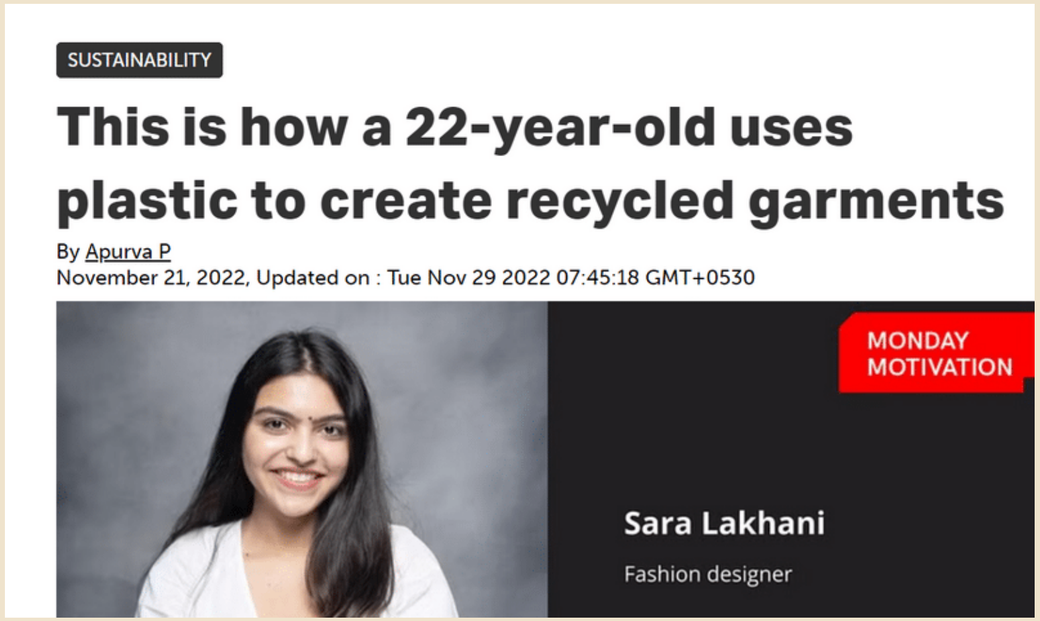
NEWS / BLOGS / ENVIRONMENT / Recycling waste can generate crores in revenue in India

ENVIRONMENT

Recycling waste can generate crores in revenue in India

June 9, 2022, 11:03 PM IST / Madhur Rathi in Voices, Environment, TOI

FACEBOOK TWITTER LINKEDIN EMAIL



SUSTAINABILITY

This is how a 22-year-old uses plastic to create recycled garments

By Apurva P

November 21, 2022, Updated on : Tue Nov 29 2022 07:45:18 GMT+0530

Sources-

https://yourstory.com/socialstory/2022/11/22-year-old-uses-plastic-create-recycled-garments

https://www.mordorintelligence.com/industry-reports/india-waste-management-market

Market Cap and Opportunities

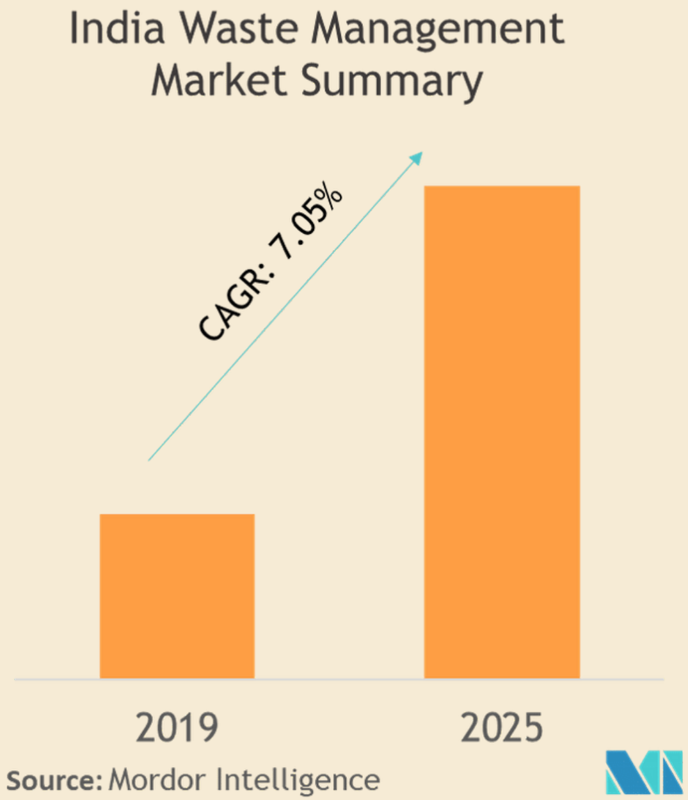
Waste management startups in India

curbwaste

recykal

BINTIX

REBOX Urban Rebox



Bintix- Collects dry waste from doorstep
Curbwaste- Realtime waste truck track, and dispatch by demand
Recykal- Provides a marketplace for waste products
Urban Rebox- Doorstep Trash Pickup

Market Cap and Opportunities

What we Offer

- Real-time status of all municipal dustbins.
- Efficient priority-based dustbin cleaning service
- Collect data from users about wastes and dustbin images to create a large crowd-sourced dataset.
- An AI-based guidance system to segregate at source, with in-app prompts.
- Incentives for users, for taking pics of wastes and using correct dustbins for disposal.
- Doorstep garbage pickup service on request, with real-time tracking.
- Marketplace to sell and buy waste materials to the highest bidder, secured by blockchain.

Introducing VSP Points-

1. People are awarded VSP points based on their waste contribution.
2. The VSP points can be converted to cash based on a unique multiplier which increases with growth in market.
3. These VSP points can act as investment funds for people, which are secured by blockchain.
4. VSP points are converted based on current market value, the multiplier is set such a way that there is always a profit.

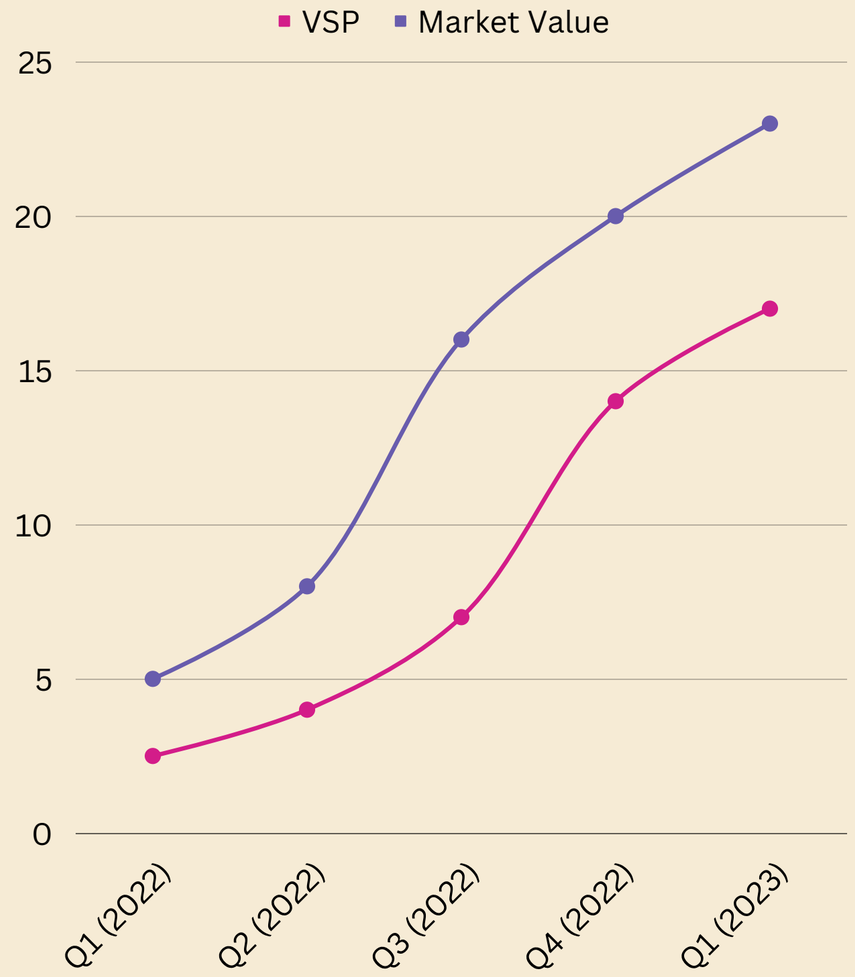
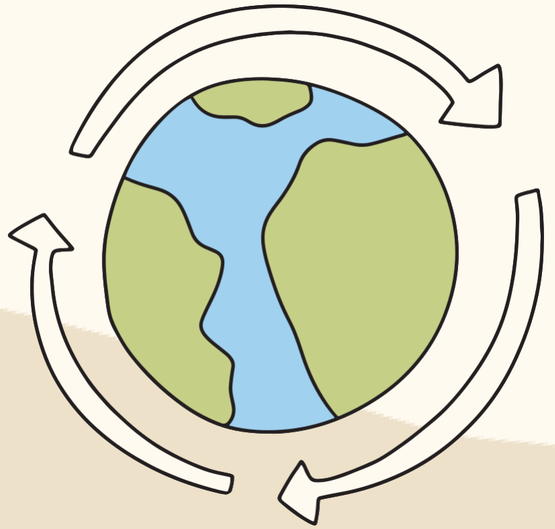


Fig. Growth of VSP with Market Value of commodity

OUR CITIES
are in our hands

StellarHackers-
Abhinandan Roul
Shubhaprasad Padhy
ITER, Siksha 'O' Anusandhan Deemed to be University