TEAM NAME – DHANANJAYAVRITI

PROJECT NAME – REVA

THEME – SMART AND RESILENT COMMUNITIES

WARRIOR FROM KIKANI VIDHYA MANDIR

AKHILESH ARAVIND – GRADE 11

MENTOR – R PRATHIPA

TITLE OF OUR PROJECT - REVA

PROBLEM STATEMENT

Increasing Waste Production and Challenges Faced in Segregation and Recycling

The amount of “solid waste , e-waste" in India has grown to be a serious issue. Since solid waste is now the fastest-growing category of official municipal waste stream worldwide, its disposal is becoming a major environmental and public health concern. The majority of electronic garbage in India is kept in homes because individuals do not know how to properly dispose of it. Solid waste and e-waste pose a risk to human health and the environment when they are improperly disassembled and processed. Consequently, it is now clear that appropriate solid waste management is required.

CARDINAL FOCUS

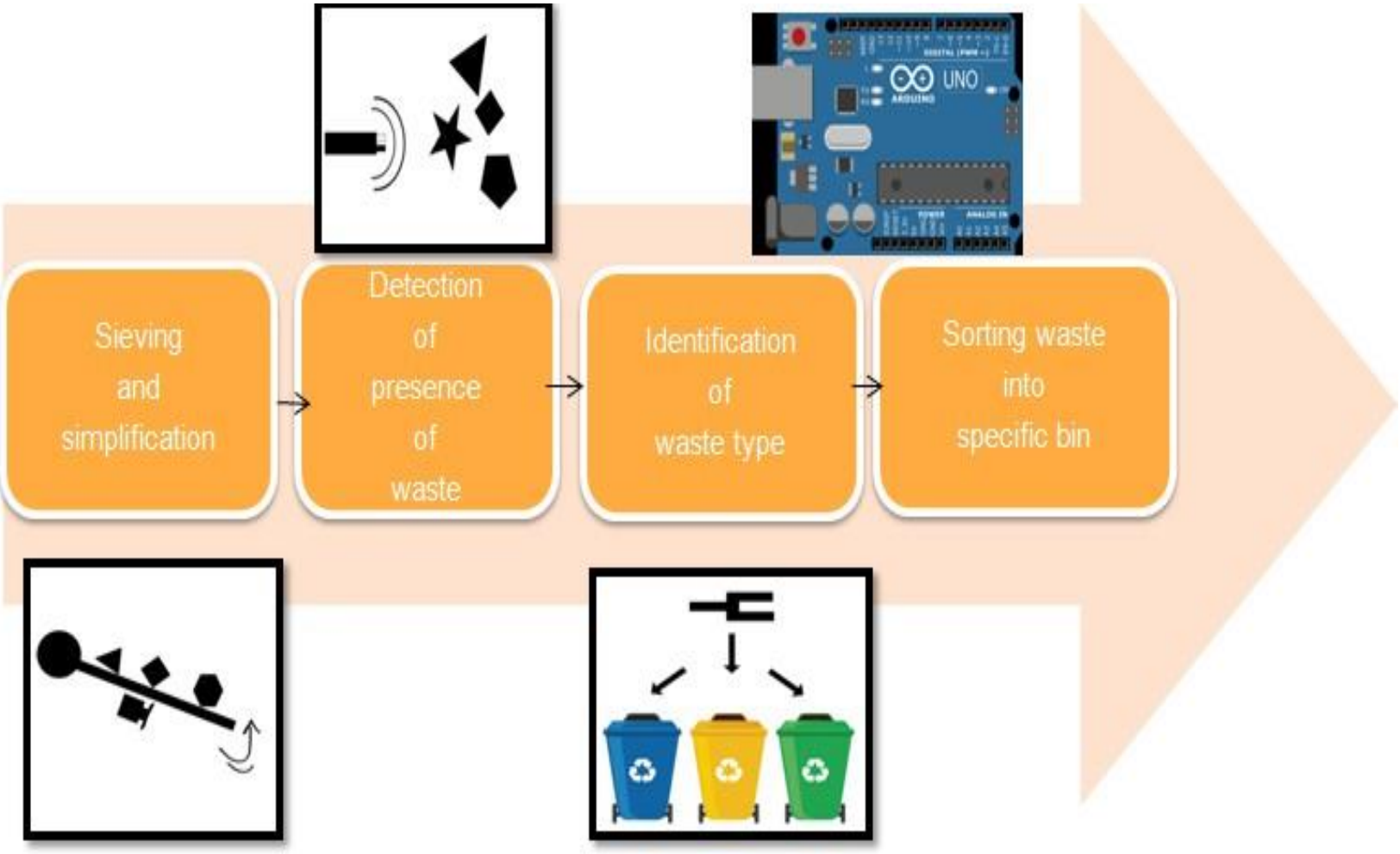
The volume of waste produced globally has been increasing at an alarming rate. According to the World Bank, global waste generation is projected to rise from 2.01 billion tonnes(2016) - 3.40 billion tonnes(2050). Insufficient infrastructure for waste collection, sorting, processing, mixed waste streams, contamination, and recycling reduces the possibility of recycling. These pains are to be relieved by our project. Also, we could build a better infrastructure for waste management through this project. Solving the problem of increasing waste production and improving segregation and recycling practices is crucial for maintaining environmental sustainability, economic stability, public health, and social well-being. It requires a collective effort from individuals, communities, businesses, and governments to adopt more sustainable practices and develop innovative solutions for effective waste management.

OUR CITY BEFORE CREATING A SMART TRUCK

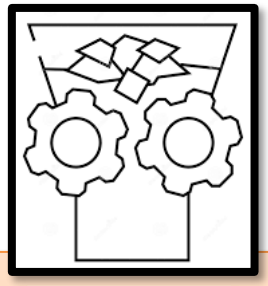
PROPOSED SOLUTION

- A smart truck is designed for detecting and sorting waste based on the size and type of materials, i.e..,e-waste, metal, dry, and wet wastes.
- E-waste are processed and segregated into metal, plastics and other materials.
- An app is designed through which the recyclers are notified about the location of recyclable materials in the garbage bins and the level of waste in each category.
- The waste is recycled into valuable products without harming the environment.
- Automated waste segregation smart bins help households, communities, and waste management workers by making waste sorting easy and efficient. They reduce the need for manual segregation, improving cleanliness and safety of our society.

PROCESS WORK FLOWCHART



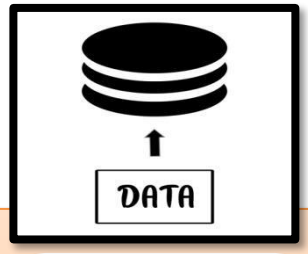
PROCESS WORK FLOWCHART – E - Waste



Shredding of E - Waste

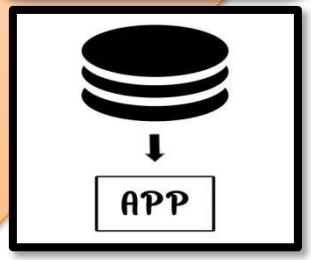
Attraction of Metals by Specialised Magnets

Separation of Plastics and other Materials

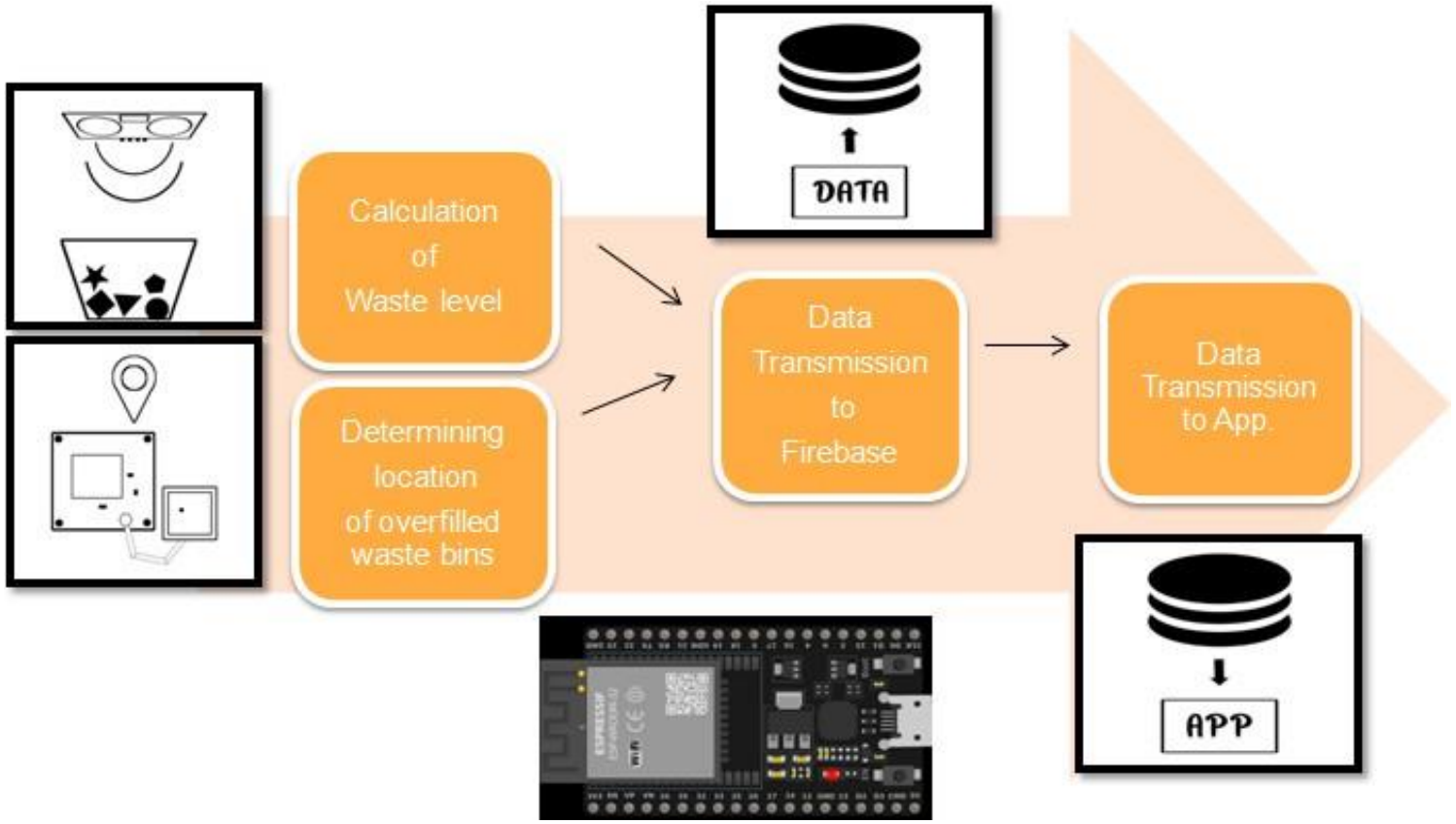


Data Transmission to Firebase

Sending Data to Recycling Collection Centres via App



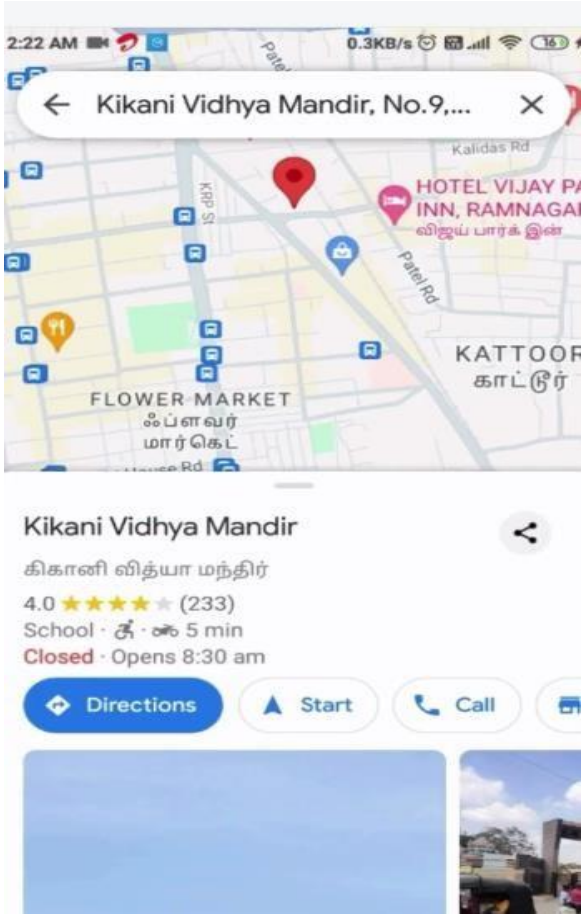
TRANSMISSION OF DATA (APP) - FLOWCHART



APP DETAILS

APP READINGS

APP LOCATION



CODING ABSTRACT

```
Servo sep;
Servo pour;
Servo jal;
intsepang;
intpourang;
bool detect=false;


#defineAOUT_PIN A0
#defineTHRESHOLD550

voidsetup(){
  sep.attach(2);
  pour.attach(9);
  jal.attach(4);
  pinMode(5,INPUT);
  sep.write(0);
  jal.write(0);
  pour.write(0);
  sepang = (0);
  pourang = (0);
  Serial.begin(9600);
}
```

```
voidloop(){
  int moist = analogRead(AOUT_PIN);
  Serial.print("Moisture = ");
  Serial.println(moist);
  intir = digitalRead(5);
  Serial.println(ir);
  Serial.println("ang=");
  Serial.println(sepang);
  Serial.println(pourang);
  if(moist <= 50){
    jal.write(0);
    sep.write(90);
    sepang = (0);
    delay(1000);
    pour.write(90);
    pourang = (90);
    delay(1000);
    Serial.println("metal");

    }
```

TECHNOLOGICAL STACK OF OUR SOLUTION

HARDWARE

- ESP32
- Arduino UNO

SOFTWARE

- Arduino IDE
- Firebase
- MIT app inventor

NOVELTY OF OUR PROJECT

Existing projects either send notifications regarding the level of waste or segregate the waste, but we have integrated both issues into a single project. We have also given ideas on how to recycle bio- and e-waste. Our project can be used either at the domestic level or at the industrial level. The system continuously monitors the waste levels in real-time. The system sends timely notifications to relevant stakeholders. Eco-Friendly Design reduces landfill waste, promotes recycling, and lowers carbon footprints through optimised waste collection. The system can be customised to meet the specific needs of different environments. Suitable for deployment in various sizes of communities, from small neighbourhoods to large metropolitan areas.

APPLICATION OF OUR PROJECT

The automatic waste segregation bin is designed to streamline waste management by automatically sorting waste into wet, dry, and metal waste categories. Equipped with sensors, the bin monitors the fill level and uses GPS to track its location. When the bin is full, a notification is sent to waste management authorities, ensuring timely collection and efficient resource allocation.

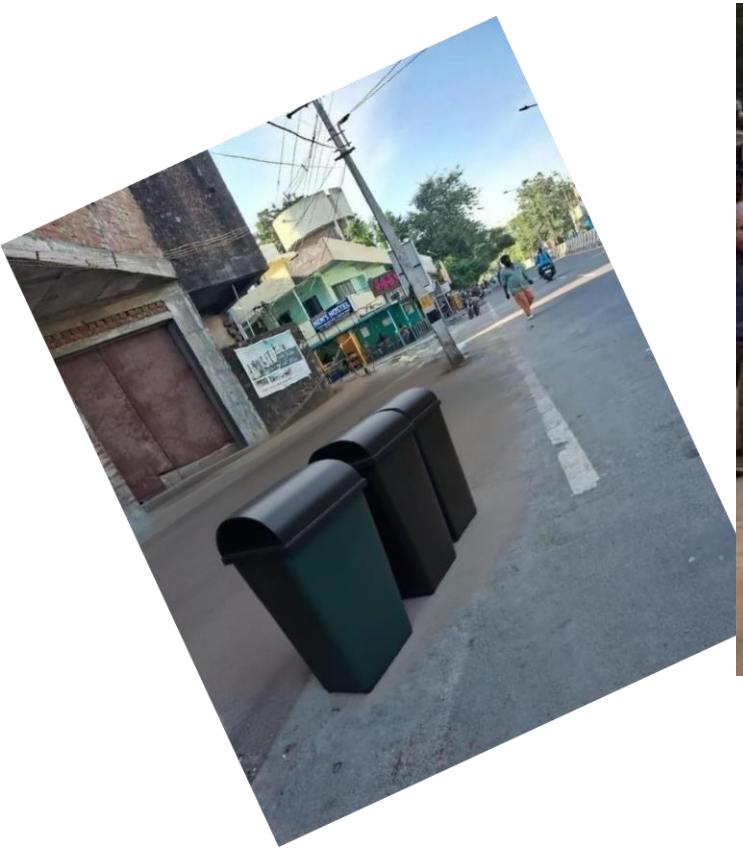
TARGET BENEFICIARIES

- Municipal Corporations
- Communities and households
- Waste management companies

SCOPE FOR SCALING UP

- Connect the bins with city-wide IoT networks for real-time data analytics and urban planning.
- Deploy in malls, offices, and public places to increase the impact on waste management.
- Create a closed-loop system where segregated waste is directly sent to recycling facilities.
- Develop mobile apps for users to locate nearby bins, track their waste contribution, and earn rewards for proper disposal.

OUR CLEAN CITY



DEPENDENCIES OF OUR SOLUTION

- Sensor accuracy and reliability
- Power management
- Data transmission and connectivity in regions with poor WIFI coverage.
- Environmental conditions
- Maintenance and durability
- Data management and security
- Integration with existing waste management systems
- Regulatory and compliance issues
- User acceptance and behaviour

COMPONENTS USED

- Arduino UNO
- ESP32
- GPS Module
- Servo Motor
- IR Sensor
- Soil Moisture Sensor
- Ultrasonic Sensor
- Breadboard
- White Foamboard
- Jumper Wires
- DC Motor
- HW Battery
- MIT app inventor

MANAGE WASTE, PRESERVE NATURE!

THANK YOU!

SUSTAINABLE WASTE, SUSTAINABLE FUTURE!