

SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
COIMBATORE – 641035

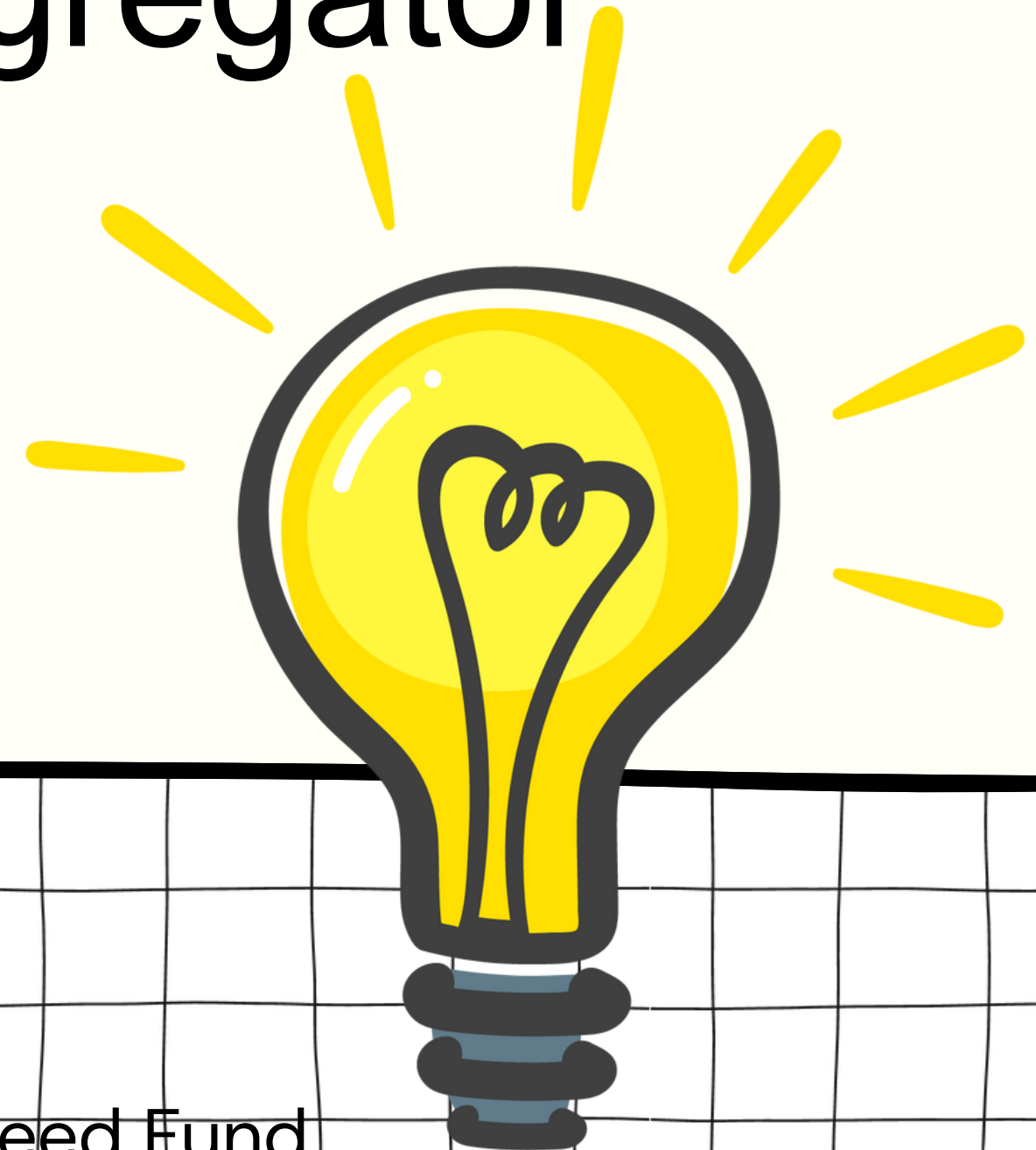
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING



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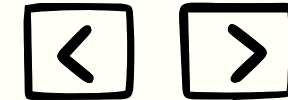
Automatic Waste Segregator for Smart Cities

Stimulating innovation through collaboration



Proposal to Raise Seed Fund

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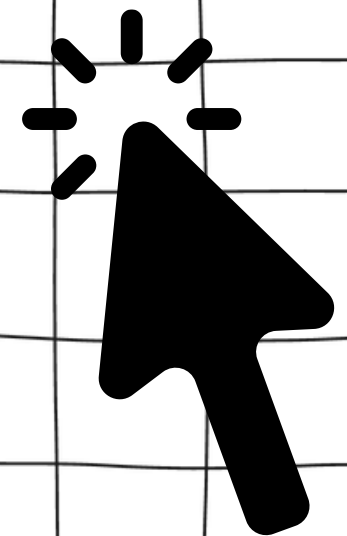
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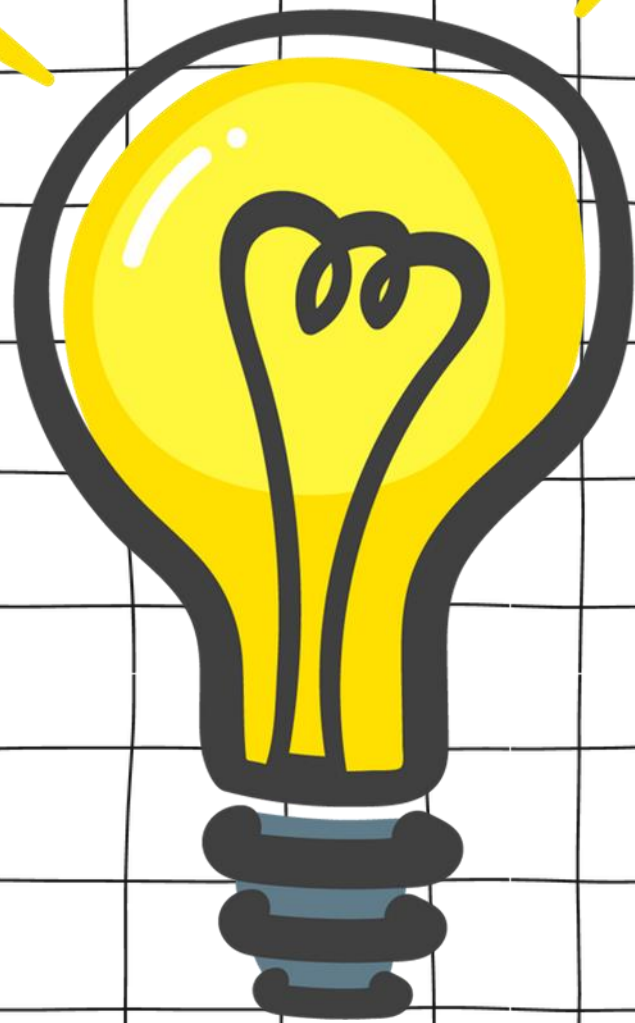
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Introduction

- This Project aims to address the pressing challenge of **efficient waste management** in urban environments.
- As cities grow, so does the need for innovative solutions to **streamline** waste segregation processes.
- This project proposes the development of an **automated system** leveraging **sensor technology** and machine learning algorithms to accurately **segregate** different types of **waste at the source**.
- By integrating smart sensors and actuators into waste collection bins, the system can **identify and sort** recyclable, organic, and non-recyclable waste in real-time.
- Through this automation, the project aims to enhance recycling rates, reduce landfill overflow, and promote sustainable practices in **urban areas**.
- The proposed solution holds significant potential for optimizing waste management operations in **smart cities**, ultimately contributing to a **cleaner, greener, and more sustainable** urban environment.

The team



Dr.R.Senthil Kumar
Associate Professor



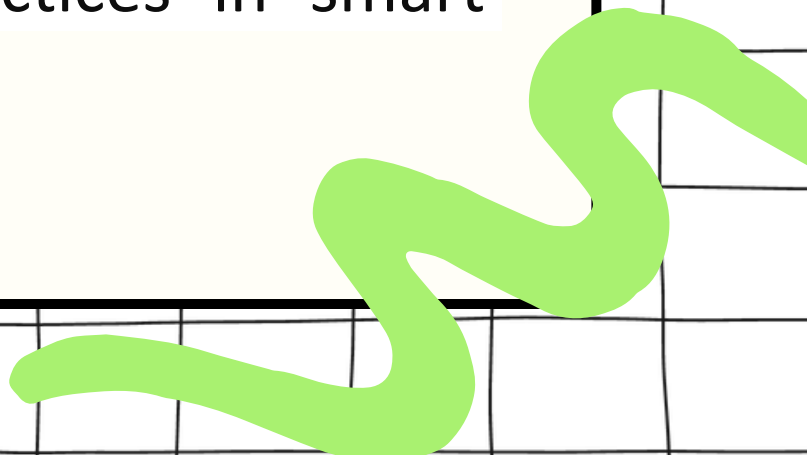
S.Bharath
Assistant Professor

TEAM MEMBERS

ABISHEK.R
ABOORVA.V
ARJUN.K.M
KRISHNA KUMAR.G
YOGANANTH.P



Objective

- To Develop a **sensor-based system** to accurately **identify and sort recyclable, organic, and non-recyclable waste** in real-time.
 - To Implement machine learning algorithms to **automate the waste segregation process** at the source, reducing manual labor and human error.
 - To Integrate the automated system into **urban waste management** infrastructure to improve recycling rates, reduce landfill overflow, and promote sustainable practices in smart cities.
- 

Business Model Canvas

Key Partners

- **Municipalities and local governments** for access to infrastructure and regulations.
- **Technology providers** for sensors, data analytics, and IoT devices.
- **Waste management companies** for logistics and processing.. 


Key Activities

- Manufacturing & deployment of hardware
- Integration with existing
- Monitoring, Maintenance and data analysis

Customer Relation

- Partnerships- local governments
- Support for system maintenance
- Educational campaigns
- Feedback mechanisms

Cost Structure

- **Research and development** costs for technology enhancement. 
- **Manufacturing and installation expenses** for hardware components.
- **Operational costs** for maintenance, data analysis, and customer support.
- **Marketing** and educational campaign expenditures.


Value Propositions

- Efficient waste segregation
- Reduced environmental impact
- Cost savings for municipalities
- Improved public health
- Reduced exposure to hazardous waste.

Customer Segments

- Municipalities and local governments
- Waste management companies
- Citizens and communities


Key Resources

- Sensors & IoT
- Installation & maintenance
- Fund 

Channels

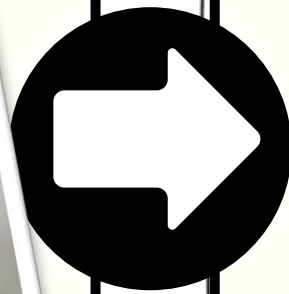
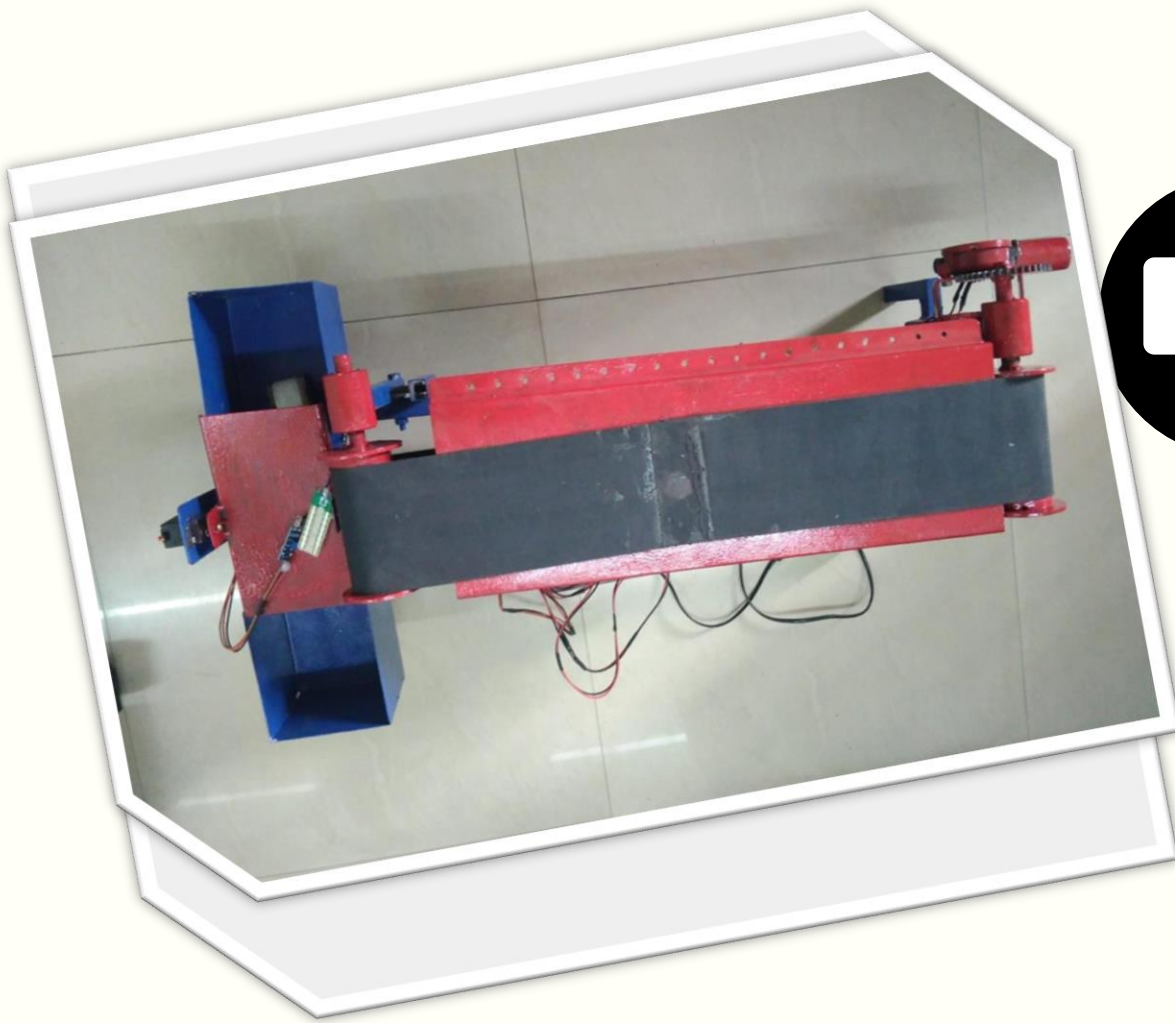
- Direct Sales
- Online Platforms 

Revenue Streams

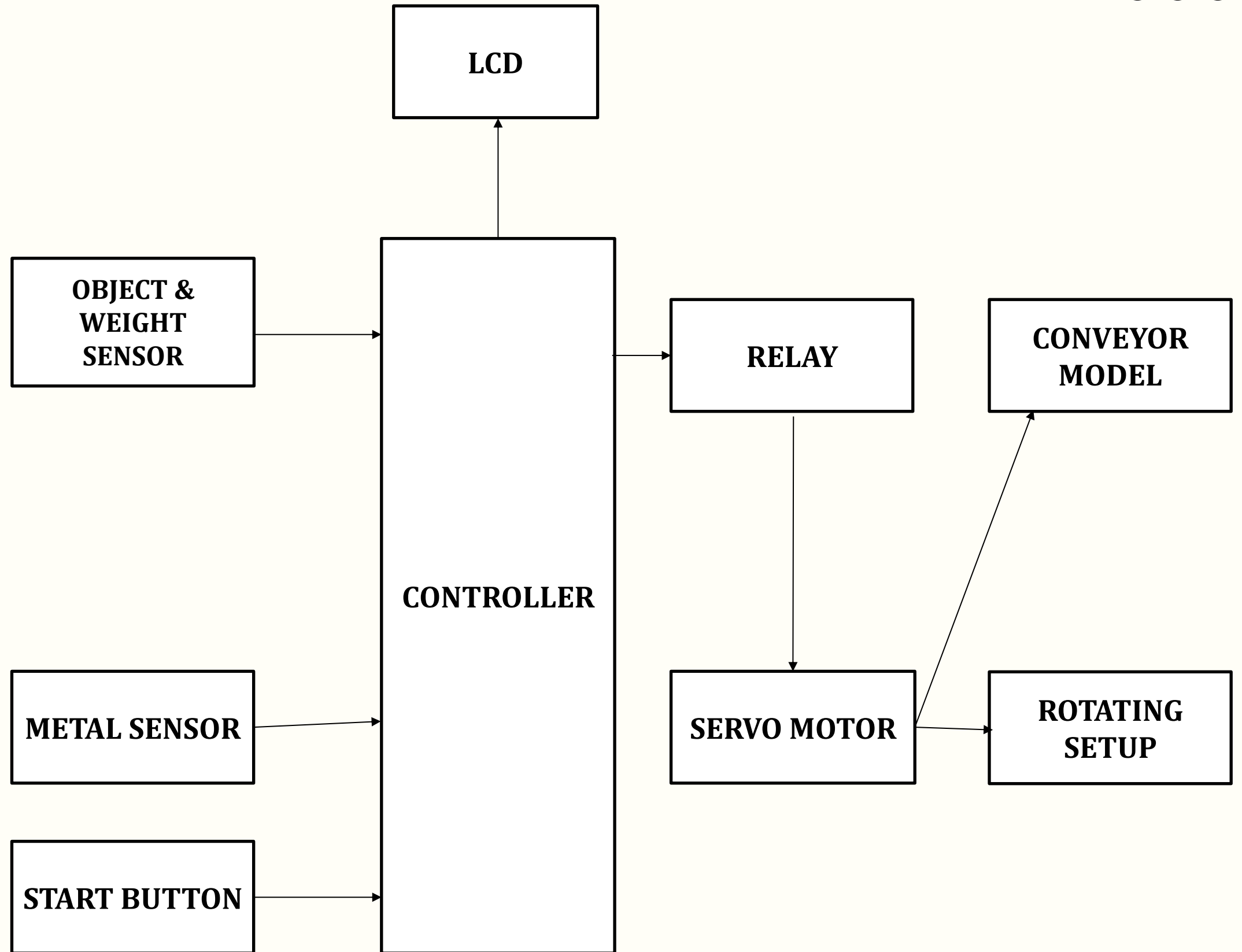
- **Initial sales** revenue from hardware installation and setup. 
- **Subscription** or service-based revenue model for ongoing **maintenance** and support.
- Revenue sharing agreements
- Potential monetization of **data insights** generated through waste management analytics.

Execution Block

Fundamental Prototype -
April

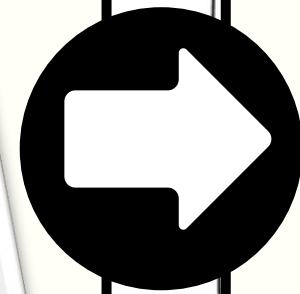


Fundamental Ideation

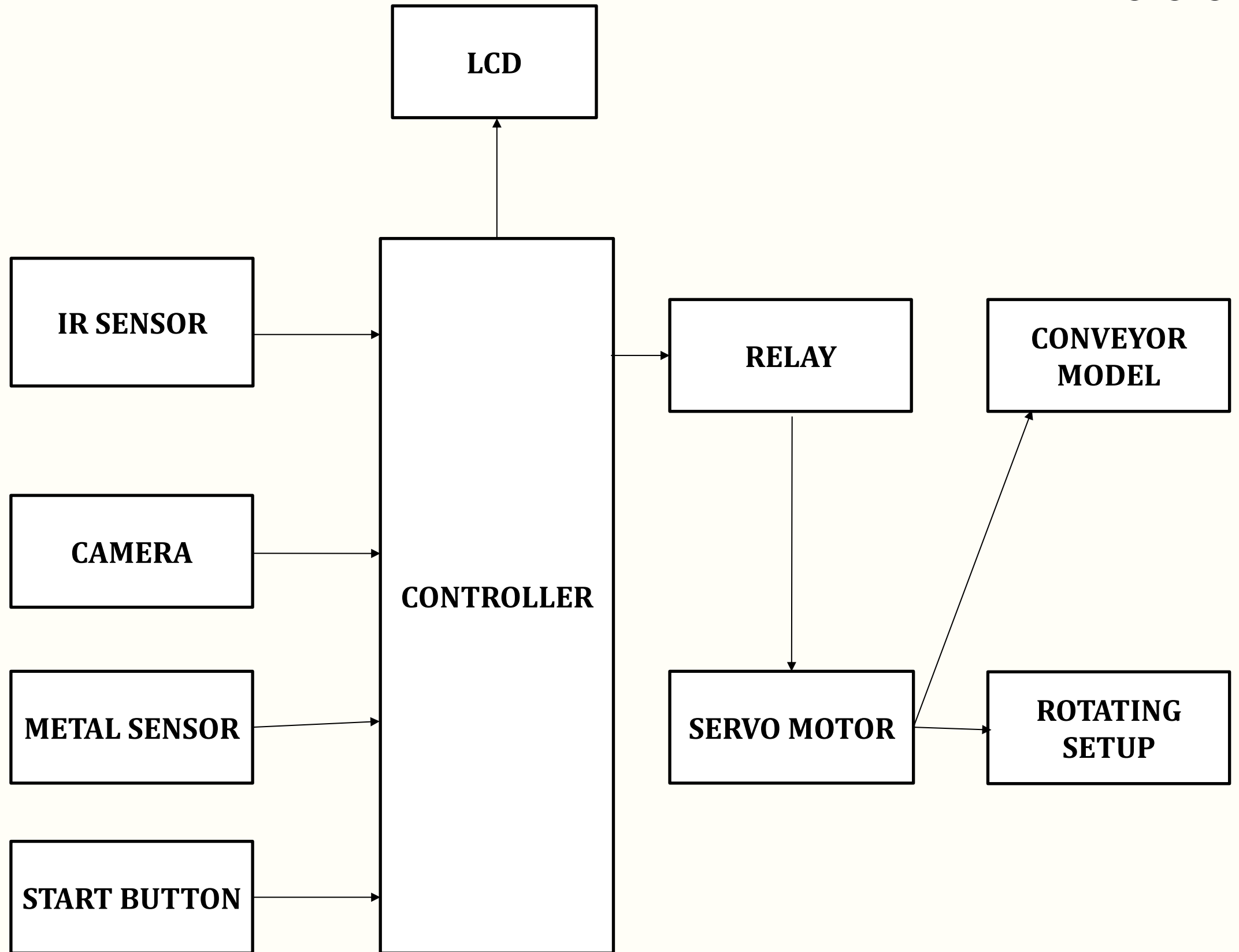


Execution Block

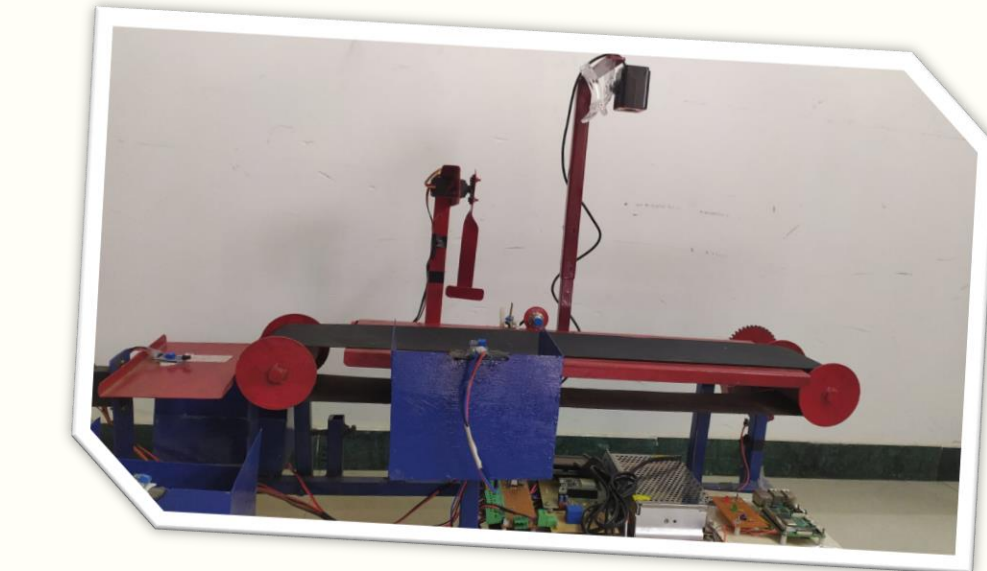
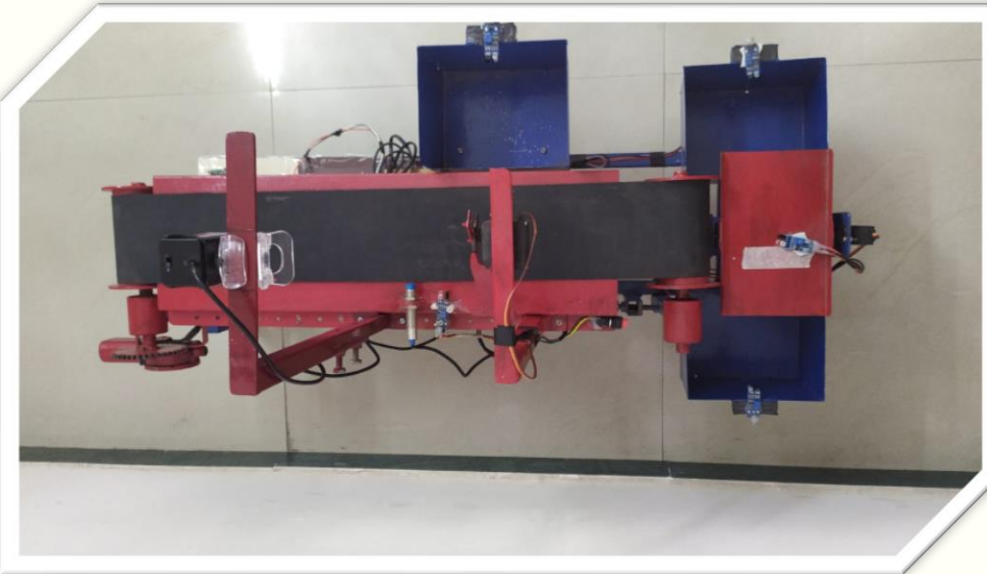
Fundamental Prototype -
May



Fundamental Ideation



Final Testing Completion - June





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AUTOMATIC WASTE SEGREGATOR for Smart Cities

FAQ

BRING YOUR OWN EQUIPMENT SO YOU DON'T USE PLASTIC TOOLS.

Self-awareness is certainly important to deal with waste so that you don't always use plastic materials. Now there are many tools made of stainless steel.

USING EQUIPMENT THAT IS NOT USED ONCE AND THEN THROWN AWAY.

DISPOSE OF NON-RECYCLABLE WASTE AT A LANDFILL.

The importance of disposing of waste in landfills that cannot be recycled is that there are tools that can make it decompose even though it takes a long time.

TURN ORGANIC WASTE INTO FERTILIZER.

SEPARATE THE TRASH ACCORDING TO THE KINDS OF RAW MATERIALS

There are various materials that are difficult to decompose into those that are easy to decompose. The purpose of sorting waste is to make it easier to recycle.

USE THIS AUTOMATIC WASTE SEGREGATOR

This Machine does the process of Automatically segregating as degradable/ Non degradable waste at the generation point itself, Thus Enabling the Easy & Effective disposal of Garbage using some sensors and camera

REDUCE THE USE OF PLASTIC OR OTHER WASTE.

Managing waste properly helps us save the earth. There has been a lot of garbage in urban areas that has accumulated due to a lack of education and a lack of awareness among us to dispose of garbage properly and correctly.








Dr. R. Senthil Kumar
Associate Professor / EEE



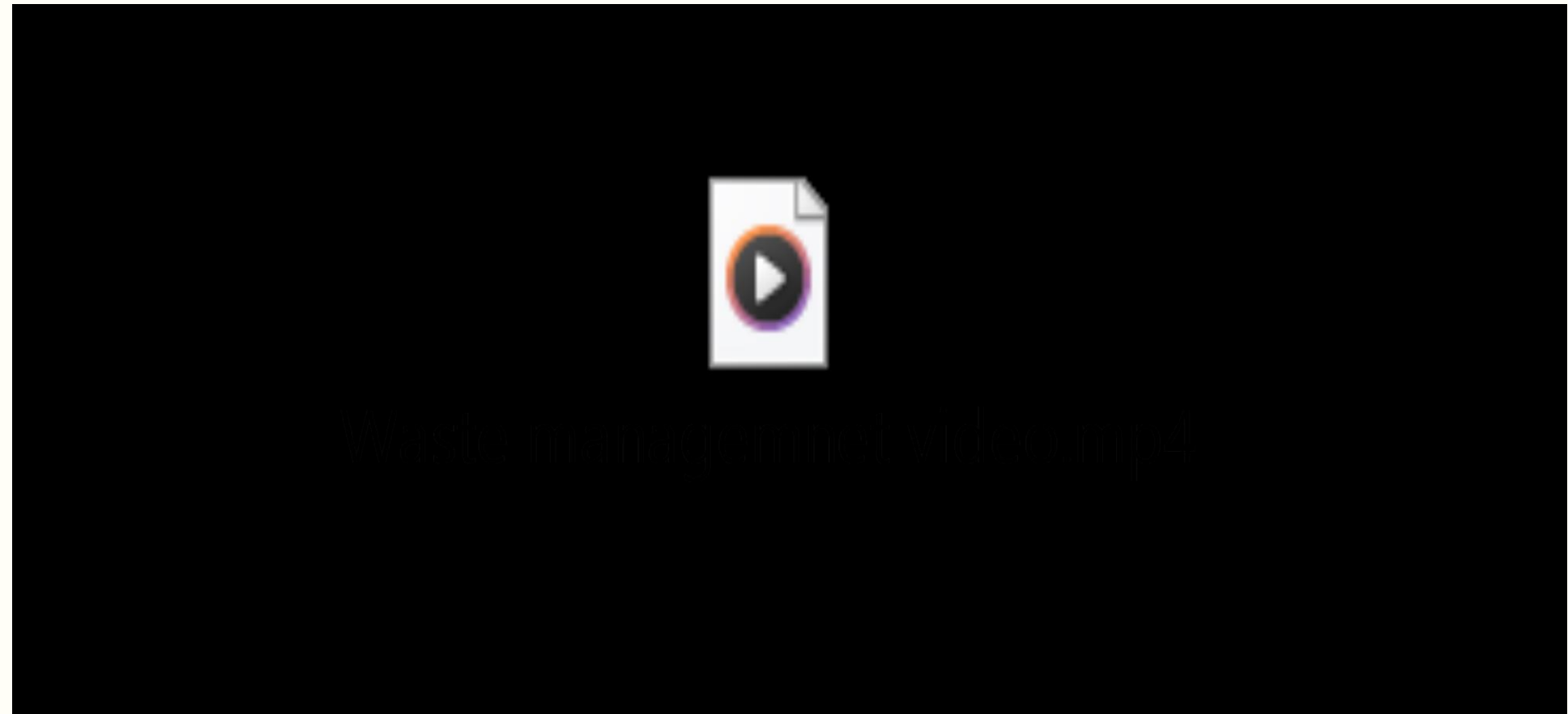
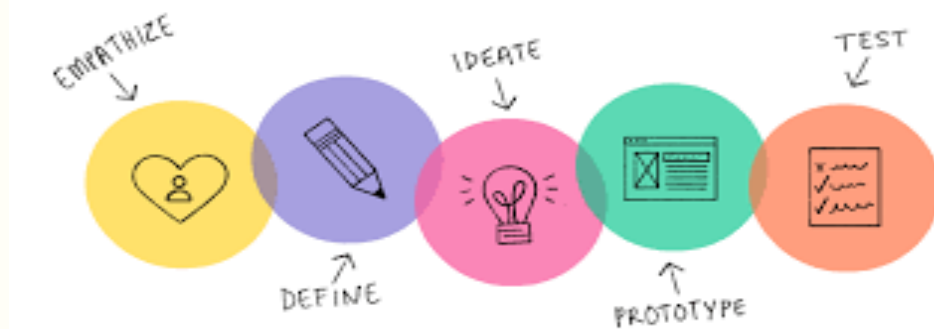
Mr. S. Bharath
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ABISHEK R - I I EEE
ABOORVA V - I I EEE
ARJUN K M - I I EEE
KRISHNA KUMAR G - I I EEE
YOGANANTH P - I I EEE



Design Thinking

Key Insights



Empathy

Interviews, surveys, and observations of stakeholders involved in urban waste management, including city officials, waste management companies, residents, and environmental organizations.

Define

Identify specific pain points, goals, and desired outcomes related to waste segregation in smart cities
Reframe the problem statement to focus on user needs and objectives

Ideate

Generate creative solutions and concepts for automating waste segregation in urban environments in sensor technology, machine learning, waste management, and urban planning.

Prototype

Develop prototypes and proof-of-concepts to test and validate different design ideas.

Test

Analyze test results and iterate on the design based on insights gained during the testing phase.

SAMPLES

- Metal
- Degradable
- Non-degradable

METAL



Degradable



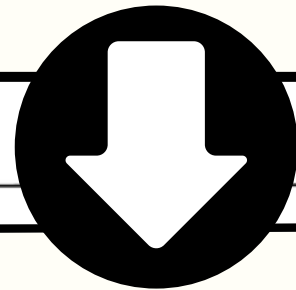
Non-degradable





The best ideas

Outcomes



- 
- 
- Enhanced waste segregation accuracy through sensor technology and machine learning.
 - Increased recycling rates and reduced environmental impact.
 - Improved urban sustainability by promoting efficient waste management practices.



Conclusion

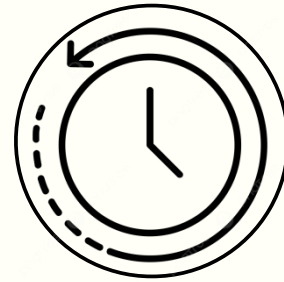
The Project offers a promising solution to urban waste challenges. By integrating technology and sustainable practices, it aims to create cleaner, greener cities, though successful implementation will require collaboration and ongoing optimization.



Deliverables

- A Product
- A Research Paper Publication
- An Utility Patent
- A Design Patent

Timeline



- April'24 – Hardware setup completed
- May'24 –Implementation of Camera & software requirements
- June'24 – Testing and Prototype completion.

Budget



- Non Recurring : Rs.37,000
- Recurring : Rs.5,000

Collaborations



- Emcog Solutions, Chennai
- Blackstraw AI, Chennai



Thank you

Towards a smarter & Greener Environment

