

Bachelor of Technology

ET208: Mini Project 1 : Phase 1 Presentation



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(Autonomous Institute affiliated to the University of Mumbai)
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A Presentation on
Smart Dustbin

by

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Introduction

- In today's world, one of the major environmental problems is collection, management and disposal of the garbage.
- Collecting garbage in an unordered way leads leads to overfilling of bins, rotten garbage smell.
- Daily more than 1.50 lakh tonnes of solid waste is generated in India. This waste generated directly into landfills.
- To address this issue, segregation should be done at various levels.
- If this waste could be segregated into dry and wet and properly treated, it could solve the problem at many levels of waste management.

Introduction

- Today's world depends highly on technology for efficient functioning.
- Technological devices are made to be “smart” such that they can operate interactively and autonomously.
Examples: Smart mobile phones, smart refrigerators, smart watches, etc.
- We use dustbins on a daily basis for collection of waste.
- **Dustbins are primary devices of waste management.**
- What if these dustbins were made “smart” to detect an incoming user, identify the type of waste – dry or wet, and indicate their fullness?
- “Smart” dustbins would help make the process of municipal waste management much more efficient!

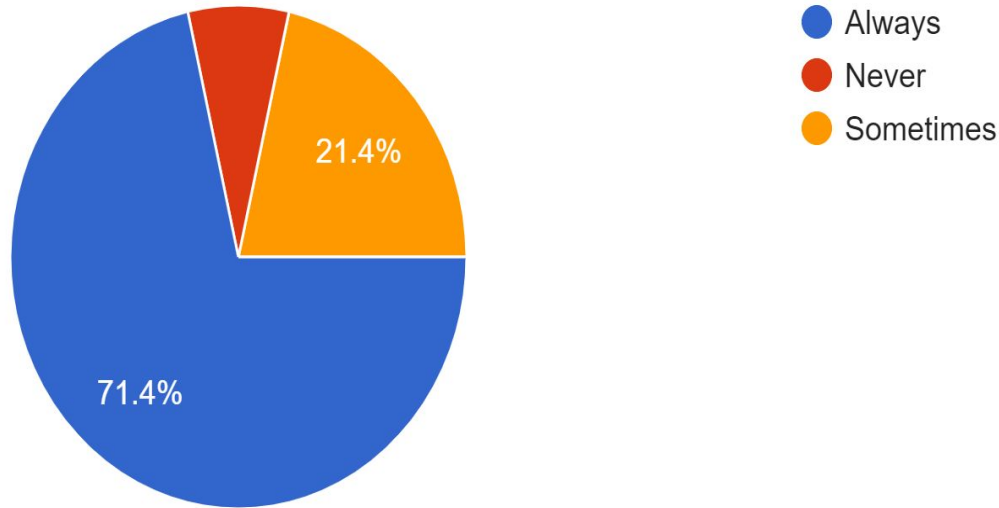
- Dry Waste comprises of paper, metallic waste, plastic... anything which can be reused and kept for long time.
- Wet Waste comprises of organic material like vegetable peels and fruit waste which can be made into compost and can produce biogas.
- The compost obtained can be used by farmers and can reduce the dependency on fertilizers and pesticides.



Field Survey

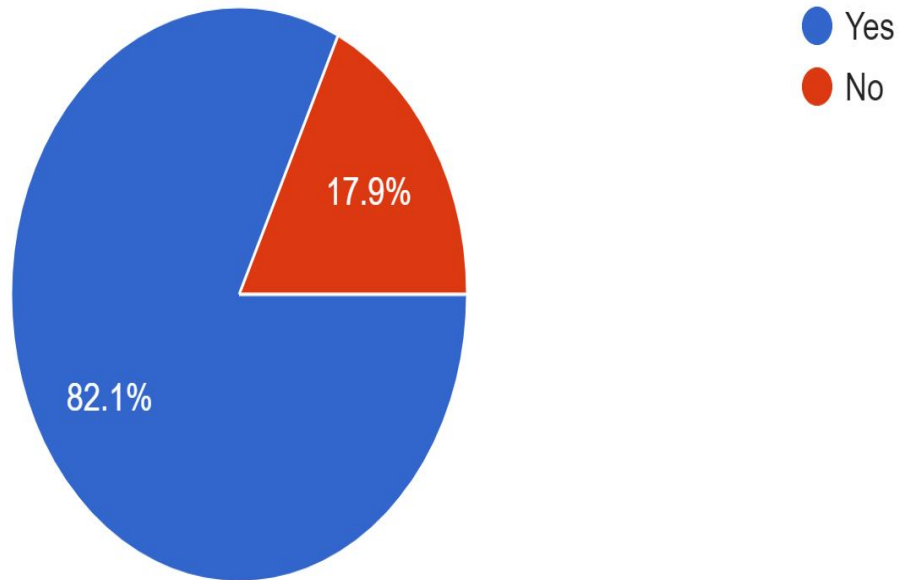
Do you come throw the waste into dry and wet bins at public places?

28 responses



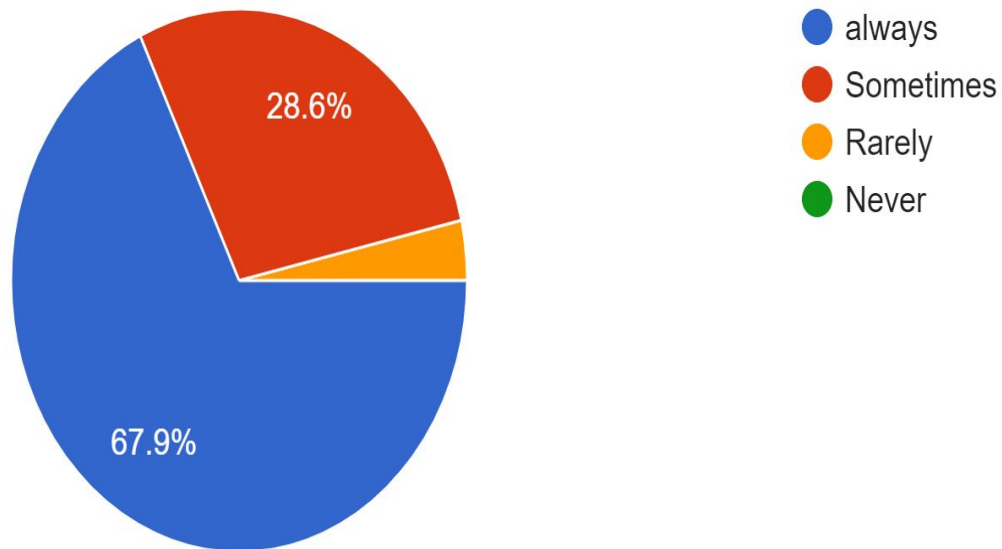
Is this practice implemented at your housing society

28 responses



Do you segregate waste into dry and wet before disposal

28 responses



Literature Survey

- We came across some of the research papers implemented on segregation of waste using Arduino UNO and motors and so on... One such paper was from Amrita University.
- There are few versions of these using smart bins or using IoT to check that whether the bin is full or not and accordingly inform the local authorities.
- Learnt about the applications of ultrasonic sensors by studying its datasheet.

Market Survey

- There are a handful of patents in the domain of waste segregation.
- The patents that we studied are basically smart bins
- There are several companies that make large scale waste segregators which are to be used in dumping grounds/segregation plants.
- Olive Enviro Industries, Techno Power Engineering, Krishna Engineering Systems.
- These machines are expensive to both procure and maintain.
- Currently there is no commercial system for segregation of dry, wet and mixed waste at a household/public level.
- The only available method is the manual segregation method which is a tedious, time-consuming method and also poses risks to human life.

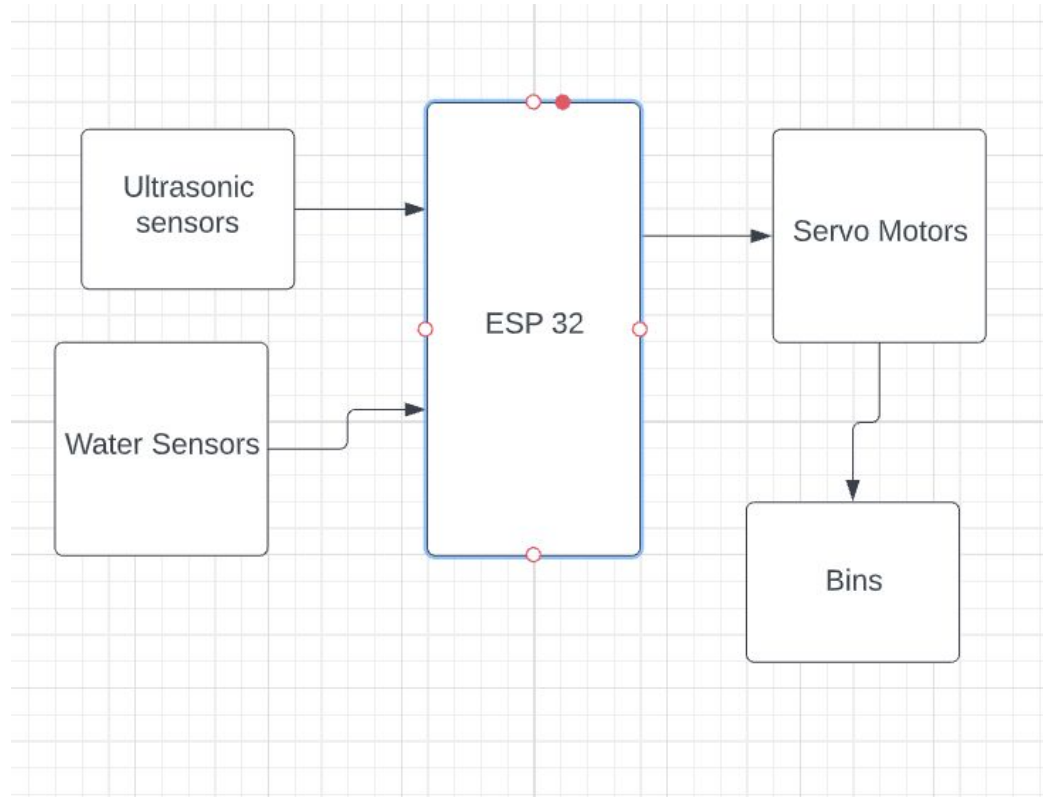
Problem Statement

- About 62 million tons of waste is generated every year in our country.
- 43 million ton is collected out of which only 12 million is treated/recycled.
- Almost 31 million tons are dumped in landfills.
- Segregation of such large amount of waste requires substantial manpower and machinery.
- The large scale waste segregators available are expensive to procure and maintain.

Project Goals

- Detection of incoming user and activation of the system.
- Identification of the type of waste - dry and wet.
- Putting of the identified waste in its respective compartment.
- Indication of when the bin is full.
- Collection of data for determining its accuracy of identification.

Block Diagram



Hardware/Software requirements

Component	Price
ESP32	400
Servo motor (1)	300
Parallel plate capacitive sensor (water sensor)	150
Breadboard	65
IR Sensors (3)	225
Wires	20
Cardboard (body of dustbin)	100

Project Plan

Date	Expected progress
Jan-Feb 2022	Study and reviewing the literature of the project
09/03/2022	Phase-1 Presentation
13/03/2022	Procurement of components
Mid-March 2022	Assembling and testing of hardware.
End of march	Phase-2
Mid April	Phase 3

Impact of Project and Future Scope

- Ease of use of dustbins at places like railway stations, classrooms.
- Efficient segregation of waste at the source itself.
- Elimination of need of dumping waste in a landfill reducing the load on the large scale waste segregators.
- Reduction of Manual labour required at toxic landfills.
- Reduction of cost of segregation.
- Segregated wet waste can be used to make compost by installing a compost machine.
- The prototype can be made much more efficient using Machine Learning.

References

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