

**Smart Waste Management System**

**Group Member**

**1.Teeranai Sangtaera 65125056**

**2.Thanaphat Tenghirun 65126955**

**3.Basirin Saman 65127367**

**System Interfacing, Integration and Internet of things**

# **Abstract**

The project "Detects the amount of garbage in the bin and notifies the Website." aims to monitor the trash level in the bin by using an Infared Sensor, an effective device for measuring distance. The collected data is sent to Thingspeak, an IoT platform, where it is displayed in graphs and values ​​on user-generated website pages. So that users can receive information about the amount of waste in the bin immediately and conveniently for example, cleaning the trash can in a timely manner or checking the trash level in the trash can to prevent it from filling up. The results are displayed on the website so that users can access information anywhere, anytime. And there is a notification via the internet when the trash level in the tank exceeds a pre-determined limit.

# **Table of Contents**

[Abstract 1](#_Toc161753751)

[Table of Contents 2](#_Toc161753752)

[Introduction 3](#_Toc161753753)

[Background 3](#_Toc161753754)

[Experimental Setup 4](#_Toc161753755)

[Results 5](#_Toc161753756)

[Discussion 5](#_Toc161753757)

[Conclusion 6](#_Toc161753758)

[References 6](#_Toc161753759)

# Introduction

The project " Smart Waste Management System" was born out of the need to solve problems related to waste management at the individual or corporate level. The main problem is the lack of a system that can effectively detect and track the amount of waste in the tank. This functionality is preferred because of the benefits it provides for example, saving time in waste management and reducing risks related to health and the environment. Detection and notification through Thingspeak and display it on the created website page. It allows users to access information instantly and conveniently. The goal of this project is to develop an efficient system for managing waste and increasing efficiency in the sustainable use of resources. and reduce problems arising from the accumulation of waste in society and the environment quickly and efficiently.

# Background

To solve the problem of waste management and increase efficiency in sustainable use of resources through the project "Detect the amount of trash in a bin and notify Thingspeak", we must plan operations systematically and analyze them. Proper troubleshooting as follows:

1. Operational planning : It begins with defining the details of the project to provide a clear overview and operational plan, such as collecting data on the amount of waste in the tank using sensors. Sending data to Thingspeak and creating websites for data display
2. Problem analysis : We must review the problems related to waste management. Using seminar documents that have already been published and examine methods for solving problems in related research. By using data analysis and prediction techniques.
3. Relevance : We will need to explain how we use the data and related technology, such as using the MFRC522 RFID sensor to detect and read RFID/NFC tags, and sending the data to Thingspeak for storage and display.
4. Troubleshooting : We will use seminar documents and related research as a guide to troubleshooting. By using data analysis techniques such as using the MFRC522 RFID sensor to detect and read RFID/NFC tags and sending the data to Thingspeak for storage and display.

By planning and reviewing problem analysis and solutions in related research, we will be able to properly understand and solve problems in our projects. and allows users to present information and display results that are easy to understand and efficient in waste management.

# Experimental Setup

The project " Smart Waste Management System" has been developed to help solve this problem. It uses currently available technology to detect the amount of waste contained in the tank. In this project, Infared and Ultrasonic sensors are used that are installed in garbage cans. and store the obtained information in the Thingspeak platform. Using Thingspeak as part of a project to collect waste data and analyze the data It allows users to view information on the amount of garbage that has been detected in a graph format. and use that information to analyze and plan future waste management.

A challenge in this project may be improving and adapting the technology to suit different locations and environments. Including managing data received from sensors to be extremely accurate and reliable.

# Results

From the results obtained The website displays graphs and data values, explaining what those values ​​are. and shows a picture of when the garbage reaches the level that the sensor can detect, which has 3 levels: when the garbage reaches half of the tank When the trash bin is full And when the trash can is empty It receives data from sensors that are sent to Thingspeak. As for the hardware side of the device, there is no problem. But the problem encountered is that when the sensor reads the value, it takes time to send the data to Thingspeak, and the website that is created takes time to retrieve the data, which may cause it to be a little slow. This problem depends on each person's internet.

# Discussion

Results from data analysis in the project " Smart Waste Management System " is important information for agencies or individuals involved in waste management and the environment, such as local authorities. Agencies related to the environment or researchers who study waste management and reducing the amount of waste in that area. These results can also be used to evaluate the results of waste management actions. and use it as evidence for the improvement and efficiency of activities related to reducing the amount of waste in that area.

The results from data analysis are an important part of helping us understand the problem and make informed decisions about waste management in that area. reasonably and efficiently

# Conclusion

This project is to analyze and manage the amount of waste in tanks. By using Infered Sensor technology to detect the amount of waste. and send the data to Thingspeak for analysis and display. The results help in planning waste management and effectively evaluating activities on the environment. Using this technology simplifies waste detection and analysis. and is an effective tool for managing waste more efficiently Further investigation into data collection and evaluation is important to make the project more effective in the future.

# References

1.Cybernetic Systems (Thailand) Co., Ltd.:

Website: https://www.cybertice.com/

2.DEPA :

Website: https://www.depa.or.th/

3. Nordsense:

Title: The Ultimate Guide to Smart Waste Management

Author: Nordsense

Website: https://nordsense.com/the-ultimate-guide-to-smart-waste-management/