

# CHAPTER 1

## INTRODUCTION

### 1.1. Background

Waste production in Indonesia is very large and is considered normal if people throw garbage so that it is considered endless. Bad impacts will be felt if residents are lacking in education on how to properly dispose of waste. The amount of garbage mixed together causes unpleasant odors and diseases to the surroundings if not disposed of in its place. This main problem also spurs on the problem of residents who are not educated about waste disposal. There is still a lack of public awareness and concern for environmental cleanliness. The waste problem is still a serious problem for the government. Lack of information technology waste management by cleaning officers which causes slow waste handling. Information about the condition of the bin volume can help prevent trash accumulation and disease transmission. Therefore, by ordering early detection tools about volume conditions the trash can send information that the trash is full for immediately placed quickly.

Based on the described problem, this project proposed creating a smart trash bin that can separate between organic and inorganic waste. The prototype made using NodeMCU ESP 8266 as the microcontroller, the LDR sensor as a tool for sorting organic and inorganic waste without metal content, Using IR sensor for detect trash to read the movement of incoming trash, NodeMCU itself is available using Wifi from its microcontroller to send data to thingspeak, servo motor to open, close and sort waste according to directions from the LDR later. This application system is used using the Arduino IDE as a cross-platform application. This research uses plastic

waste and dried leaves waste for analysis and uses data stored from Thingspeak to be processed using fuzzy to find out when the garbage is full.

In this analysis, the results to be sought are the accuracy of the waste sorting and also the fuzzy algorithm itself to pick up the waste. This project creates a smart trash can that can separate organic and Inorganic waste. Smart trash can connect to a website to monitor the capacity of the trash that facilitates the cleaning process. (menambahkan benefit apa yang di dapat):

### **1.2. Problem Formulation**

From the background described above, the focus on this problem as follows:

1. How does the LDR sensor read the organic and inorganic waste as transparent and opaque objects?
2. How does the Fuzzy Logic algorithm determine the status of the garbage height level ?

### **1.3. Scope**

Limitation of the problem that the authors put forward in this study are as follows:

1. The datasets used are tissue, paper, cashier receipts, fresh leaves, thin leaves, clear bottles, frosted bottles, plastic bottles with stickers, orange peel, lemon peel, broad dry leaves, small dried leaves, mica plastic, purple plastic, tea bags, medicine bottles.
2. The sensor used to detect organic and inorganic waste is the Photosensitive LDR and IR sensor for detection of the object.
3. Organic and inorganic waste data stored in thingspeak processed using website based on PHP (Hypertext Preprocessor).
4. Fuzzy logic algorithm used to implement calculation of smart trash bin status consist Clean, Normal, Need to clean.

5. Testing the original classification of waste with true and false information

#### **1.4. Objective**

The purpose of this analysis is to create a prototype of a smart trash can that separates organic and inorganic waste based on IoT using fuzzy logic as a determinant of the level of fullness of the waste so that it is easier to clean. The light sensor that detects translucent and opaque light in reading objects is not completely translucent or opaque. The result is getting optimal results in reading translucent and blurry objects.

