

## CHAPTER 3

### RESEARCH METHODOLOGY

The purpose of this analysis is to create a prototype smart trash can for sorting organic and inorganic waste for organic and inorganic waste sorting based on IOT using fuzzy logic implemented using web based programming language. The steps are carried out in the research will be shown as follows.


#### 1. Collecting Data




The data to be used in this research are organic and inorganic waste in the form of plastic bottles and foliage from wet to dry. Data sample is shown as in table 3.1

**Table 3.1: Sample Data**

| No | Image   | Category  |
|----|---|-----------|
| 1  |  | Inorganic |

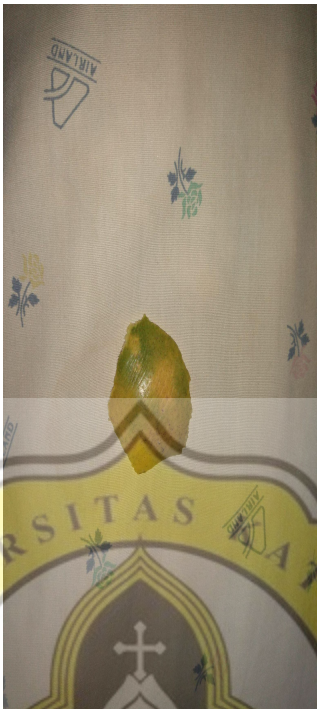

|   |  |           |
|---|--|-----------|
| 2 |   | Inorganic |
| 3 |  | Inorganic |

|   |  |         |
|---|--|---------|
| 4 |   | Organic |
| 5 |  | Organic |

|   |  |           |
|---|--|-----------|
| 6 |     | Organic   |
| 7 |   | Inorganic |
| 8 |  | Organic   |

|    |  |           |
|----|--|-----------|
| 9  |   | Organic   |
| 10 |  | Inorganic |





|    |  |         |
|----|--|---------|
| 11 |    | Organic |
| 12 |  | Organic |

|    |  |           |
|----|--|-----------|
| 13 |   | Inorganic |
| 14 |  | Organic   |

|    |  |           |
|----|--|-----------|
| 15 |   | Organic   |
| 16 |  | Inorganic |



|    |  |         |
|----|--|---------|
| 17 |   | Organic |
| 18 |  | Organic |

|    |  |           |
|----|--|-----------|
| 19 |   | Inorganic |
| 20 |  | Inorganic |

## 2. Application Design

Design in this project contains use IOT architecture and flowchart diagram. IOT architecture will represent interaction between microcontrollers that control trash can and application on the user's view based on the website. Flowchart will represent sequence of steps to perform a process from connection to display data as a chart.

## 3. Development

Development of prototype smart trash can for sorting organic and inorganic waste for organic and inorganic waste sorting based on IOT using fuzzy logic with Arduino IDE and AtomIO for code website monitoring smart trash can. Development will implement code of process includes connecting smart trash can to the thingspeak, get data from thingspeak, fuzzy calculation and show data as chart. Result of the development is application monitoring smart trash can capacity and cleaning status.

## 4. Testing and Evaluation

The testing process was conducted to determine the failure or error in programming languages written in this project. Tool used to check for determine failure or error is Arduino IDE. Evaluation of the smart trash can prototype using accuracy. The accuracy will calculate number of correct sorting for organic or inorganic waste.