

CHAPTER 1

INTRODUCTION

1.1 Background

Waste production in Indonesia is currently mostly produced by home industries. Where household waste is the biggest contributor to waste spread in Indonesia. As we all know, there are still many waste problems that seem to be an endless thing. Lack of awareness from the public about the importance of maintaining cleanliness and disposing of trash in its place is what makes waste problems in Indonesia even worse. Poor waste management greatly impacts environmental problems, such as floods, air pollution, and so on.

The cleanliness of the environment can be seen from the absence of garbage scattered around the environment. Good waste management will affect environmental cleanliness as well. Public facilities such as trash bins in the public are indeed already classified according to their categories, but some people also still throw garbage without separating the type of waste. In this case to make it easier for the community to dispose of waste without having to separate metal and non-metal waste, the researchers made a prototype of a trash bin with a sorting system between metal and non-metal waste based on the Internet of Things that aims to facilitate the community in disposing of waste without having to separate it between metal waste and metals so that with this system the interest of the community in disposing of garbage increases and of course the level of environmental cleanliness also increases. In addition, it also makes it easier for janitors to dispose of their kind of trash without having to separate them first.

The prototype will be made using the Arduino Uno microcontroller, the waste sorting model uses an inductive proximity sensor as a metal-containing waste detector, an ultrasonic sensor as a human object detector and as a trash volume detector, Ethernet Shield as a web server used to send email notifications when the trash is full, and servo motors for opening and closing trash can doors. The prototype of the trash bin with the sorting system has a stopbox mechanism because the proximity sensor requires a short distance to read the metal trash object. This trash can system was created with the Arduino IDE programming application. Arduino is a cross platform application written in functions of C and C ++. In this study, calculating the optimum distance from the Inductive Proximity sensor in reading metal junk objects and determining the accuracy of the Inductive Proximity sensor in reading objects against objects that are not fully metal is used as an analysis. The data used in the testing process were taken

by direct observation, some examples of metal waste with a composition of 20% metal, 50% metal, 70% metal, and 100% metal. And non-metallic waste such as plastic, paper, tissue and etc.

In this analysis, the results sought are the optimum distance of the Inductive Proximity sensor and the accuracy of the Inductive Proximity sensor in reading garbage objects that are not fully metal. So that the maximum results obtained regarding the optimum distance and inductive proximity sensor accuracy in reading metal trash objects.

1.2 Problem Formulation

From the background description of the above problems, the things that will be the focus of the research are as follows:

1. How to determine the optimum distance of the Inductive Proximity Sensor in reading objects?
2. How to determine the accuracy of the Inductive Proximity Sensor in reading objects, against objects that are not fully metal?

1.3 Scope

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

1. The Datasets used is metal and non-metal waste.
2. The sensor used as an object detector in front of the trash can and the volume of the trash can is the ultrasonic sensor HC-SR04.
3. The prototype of the trash can only uses Inductive Proximity sensors as metal waste detectors.
4. Sending notifications using Gmail's smtp.
5. Inductive Proximity sensor testing uses several metal objects with a composition of 20% metal, 50% metal, 70% metal and 100% metal.

1.4 Objective

The purpose of this analysis is to make a prototype of a smart trash bin that has a sorting system between metal and non-metal waste based on the Internet of Things by analyzing the optimum distance of the Inductive Proximity sensor in reading objects and analyzing the accuracy of the Inductive Proximity sensor in reading objects against objects that are not fully metal . The result is getting the optimum distance of the Inductive Proximity sensor in reading objects and the accuracy level of the Inductive Proximity sensor in reading objects that are not fully metal.

