Sri Lanka Institute of Advanced Technological Education

(SLIATE)

A proposal on

Smart Dustbin with IOT Notifications

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1. Introduction

This project proposal is submitted" to meet the requirements of the Individual Project module conducted by the" Sri Lanka Institute of Advanced Technological Education (SLIATE), 2020.

Today main issue for pollution is Garbage Overflow. It creates unhygienic condition for the people and creates bad smell around the surroundings this leads in spreading some deadly diseases & human illness. To avoid all such situations I am going to implement a project called smart dustbin with IoT notifications. Implementation is done with the help of IoT concept. The Internet of Things (IoT) is a concept in which surrounding objects are connected through wired and wireless networks without user intervention

Dustbins are small metal (or plastic) containers that are used to store trash (or waste) on a temporary basis. They are often used in homes, offices, streets, parks etc. to collect the waste. In some places, littering is a serious offence and hence Public Waste Containers are the only way to dispose small waste.

Usually, it is a common practice to use separate bins for collecting wet or dry, recyclable or non-recyclable waste.

In this project, I have designed a simple system called Smart Dustbin using Arduino, Ultrasonic Sensor, where the lid of the dustbin will automatically open itself.

2. Background and Motivation

With increase in population we have an increase in the garbage around urban areas. Here we propose a smart dustbin that operates automatically to help solve this issue using IOT and sensor based circuitry. Usual dustbins require to be opened by pressing foot against its lever and then throwing garbage. Also a person needs to keep track when it is full so that it can be emptied and does not overflow. Here I propose a smart dustbin that does all this by itself.

My system consists of a sensor in order to detect human clap signal it opens automatically without anyone needing to press its lever. The dustbin opens automatically when it receives the signal and closes its hatch. Also the dustbin consists of a level sensing ultrasonic sensor that constantly measures the level of garbage in the bin and automatically detects if it is about to fill up.

This bin is of a vast usage in offices, homes and even in public places for garbage management. Thus I get a fully automated smart dustbin that allows for automated garbage cleaning.

3. Problem in brief

Foul smell from these rotten wastes that remain untreated for a long time, due to negligence of authorities and carelessness of public may lead to long term problems. Breeding of insects and mosquitoes can create nuisance around promoting unclean environment. This may even cause dreadful diseases.

To avoid all such situations smart dustbin that allows for automated garbage cleaning.

4. Aim &objectives

4.1 Aim

Smart dustbin helps to solve the problems related to the garbage management. This project aims at developing the affordable smart dustbin using IOT and sensor based circuitry. The concept is very simple and easy to use. The major need of a smart lifestyle begins with cleanliness and cleanliness begins with dustbin. A society will get its waste dispatched properly only if the dustbins are placed well and collected in well prepared.

4.2 Objectives

In this project is to design and build a prototype for an automatic open dustbin that can automatically open the lid when it detects the people who want to throw out their trash. It also can detect the level of the trash that inside the dustbin.

Waste Management is all the activities and actions required to manage waste from inception to its final disposal. So this can be done by implementing IoT based waste management using smart dustbin.

5. Proposed solution

The main concept behind the Smart Dustbin using Arduino project is Object Detection. I have already used Ultrasonic Sensor, where upon detecting an object where the Ultrasonic Sensor is placed on top of the dustbin's lid and when the sensor detects any object, it will trigger Arduino to open the lid.

5.1 Planning

In this case, the objectives and goals of the projects are to improve the process in waste handling. Identify the tools that going to use in the development process.

Methodology:

In this project methodology model takes the fundamental process activities of Project Plan, specification, Analysis, Design, development, validation and evolution and represents them as separate process phases. Using a waterfall model as a project development methodology.

5.2 Analysis

This phase includes identifying the tools, the functions of the project, and the requirements for the project.

5.3 Design

The system design tries to be cost-effective and user-friendly. The Controller employed here is the Arduino unit that receives the measurement signals from the sensor units and in turn sends command signals to the concerned authorities for the requisite actions to be taken for effective solid waste management.

6. Requirements

- Sensor detect human clap signal it opens automatically without anyone needing to press its lever.
- Sensor that constantly measures the level of garbage in the bin and automatically detects if it is about to fill up.
- The dustbin consists of a smart circuitry that transmits information over the web to signal the main garbage collector of the facility to empty the particular garbage bin.

7. Resource Requirements

Smart bin is built on Arduino board platform. The resources that are needed to complete the project.

7.1 Software Specifications

Arduino Compiler

Programming Language: C

IOTGecko

7.2 Hardware Specifications

- Arduino Uno
- Ultrasonic Sensor
- Mic Sensor
- Wi-Fi Module
- Resistors
- Capacitors
- Transistors
- Cables and Connectors
- Diodes
- PCB and Breadboards
- LED
- Transformer/Adapter
- Push Buttons
- Switch
- IC
- IC Sockets
- Bin Frame
- Mounts & Joints
- Supporting Frame

8. References

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