**THE SMART DUSTBIN USING ARDUINO**

**INTRODUCTION**

**Project Context**

A smart dustbin is a waste bin that incorporates sensors and smart technology to make waste management more efficient and environmentally friendly. It is designed to collect, and dispose of waste in a more sustainable and automated manner. The smart dustbin can also have features such as automatic lid opening, and even the ability to compact waste. These features reduce the need for manual intervention and make waste management more efficient and hygienic. The project context of a smart dustbin could include developing and designing a prototype with the necessary sensors, software, and hardware to achieve the desired functionality.

**Purpose and Description of the Project**

The purpose of a smart dustbin using Arduino is to create an automated system that can sort, organize, and dispose of waste effectively. The Arduino microcontroller is programmed to receive inputs from various sensors, such as infrared sensors, ultrasonic sensors, to detect the type of waste that is being disposed of. With this information, the Arduino can trigger the appropriate mechanism to sort and dispose of the waste. Smart dustbins using Arduino can be particularly useful in public places such as parks, schools, and offices, where it is challenging to manage the waste generated by a large number of people. Overall, a smart dustbin using Arduino can help create a more efficient, sustainable, and healthy environment by promoting better waste management practices.

**Objectives of the project**

The technical background of a smart dustbin project would involve understanding the hardware and software components required to build a working prototype. This could include sensors for waste level detection, motors for controlling the lid opening, and microcontrollers or other computing devices for processing data and controlling the device. The project would also require software development to enable the smart dustbin to communicate with other devices, such as waste management systems or mobile apps, and to analyze data from the sensors to optimize waste collection and segregation. Additionally, the project may require testing and validation of the smart dustbin in real-world scenarios to ensure its effectiveness and usability.

**TECHNICALITY OF THE PROJECT**

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The smart dust bin, powered by Arduino, is equipped with sensors to identify objects in close proximity. A signal is then transmitted to a servo motor, which unhinges the lid. The motor is programmed to shut the lid after a certain duration.

**Details of the technologies to be used**

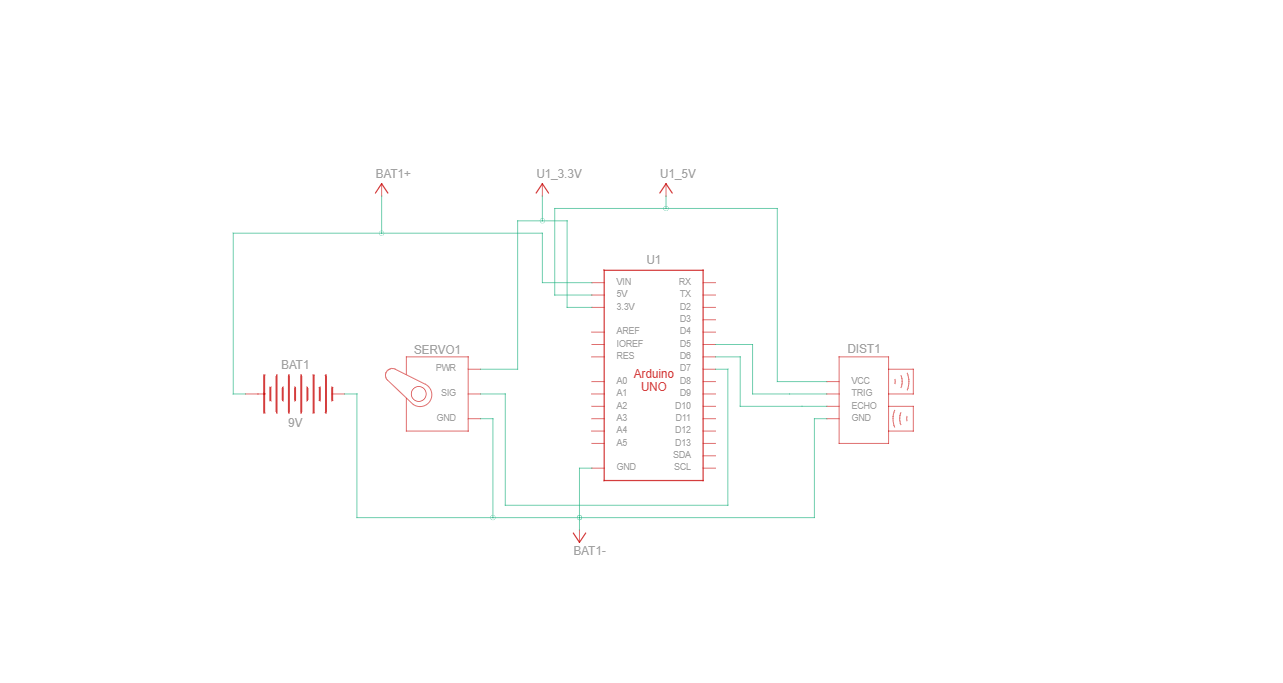
A smart dustbin typically involves a combination of hardware and software technologies to enable it to perform its functions effectively. Here are some of the key technologies that may be used in a smart dustbin:

1. Sensors: Smart dustbins typically use various types of sensors to detect the presence and type of waste. For example, infrared sensors can detect the presence of an object in the bin, while weight sensors can measure the amount of waste in the bin.
2. Internet of Things (IoT): Smart dustbins are often connected to the internet, allowing them to transmit data and receive commands. This connectivity allows for remote monitoring and control of the bin's functions.
3. Machine learning: Machine learning algorithms can be used to analyze the data collected by the sensors and make decisions about how to manage the waste. For example, a machine learning algorithm could classify the waste into different types and determine the appropriate disposal method.
4. Mobile applications: Some smart dustbins may be accompanied by mobile applications that allow users to monitor the status of the bin, receive notifications when the bin is full, and even request waste collection services.
5. Cloud computing: Cloud computing technologies can be used to store and process the data collected by the sensors, enabling real-time monitoring and analysis of the waste management system.
6. Robotics: Some smart dustbins may use robotic technology to sort and compact the waste, making it easier to transport and dispose of.

Overall, the combination of these technologies can enable smart dustbins to improve waste management practices, reduce environmental impact, and promote sustainability.

**How the project will work**

The project will work using by Arduino Uno, an ultrasonic sensor, a servo motor and a battery jumper wire. Also the code that we used.

**Circuit diagram of the project**

**Methodology**

**Data and Process Modeling**

* **Context Diagram**

The context diagram shows three main components: the Smart Dustbin, the User, and the Cloud Server.

The Smart Dustbin is the main component of the system and is responsible for collecting and storing waste. It is equipped with various sensors that allow it to detect the type and quantity of waste that has been deposited. It also has a connection to the internet, which allows it to send data to the Cloud Server.

The User is the person who interacts with the Smart Dustbin. They deposit waste into the dustbin and can also access information about the amount and type of waste that has been collected.

The Cloud Server is the central component of the system. It receives data from the Smart Dustbin and processes it. It can provide real-time information about the status of the dustbin, including the amount and type of waste that has been collected. It can also send notifications to the User when the dustbin needs to be emptied.

* **Data Flow Diagram**
* **System Flowchart**
* **Program Flowchart**
* **System Architecture**
* **Network Topology**
* **Parts and equipment needed**
* **Software Specification**
* **Installation process**
* **Building the circuit**

**Testing**

* **System testing**
* **User guide**

**Documentary**