COLEGIO DE MUNTINLUPA

DEPARTMENT OF COMPUTER ENGINEERING

Final Application Project in

Microprocessors Lab

Group No. : COEN3201 - 3A-2

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Topic : Eco-Connect: A Multi-Material Waste-to-Wi-Fi Voucher Incentive System

Project Description

Eco-Connect is an automated kiosk designed to incentivize the recycling of both PET bottles and aluminum cans by providing time-limited internet access. Operating on a "Junkshop Basis," the system evaluates items based on size and weight to determine their digital value.

When a user inserts an item, the system utilizes a Multi-Modal Verification process:

1. Ultrasonic Sensors: Measure dimensions to distinguish between small and large containers.
2. Load Cell: Measures weight to ensure the item is empty and meets recycling standards.
3. Inductive Proximity Sensor: Detects metallic properties to differentiate aluminum cans from plastic.

Once validated, an ESP32 generates a unique alphanumeric Wi-Fi voucher code displayed on an LCD screen. Furthermore, the system integrates a Real-Time IoT Dashboard, allowing administrators to monitor collection statistics, bin capacity, and voucher issuance remotely. This project promotes a circular economy by transforming physical waste into digital utility.

System Overview

Figure 1.
System overview of Eco-Connect

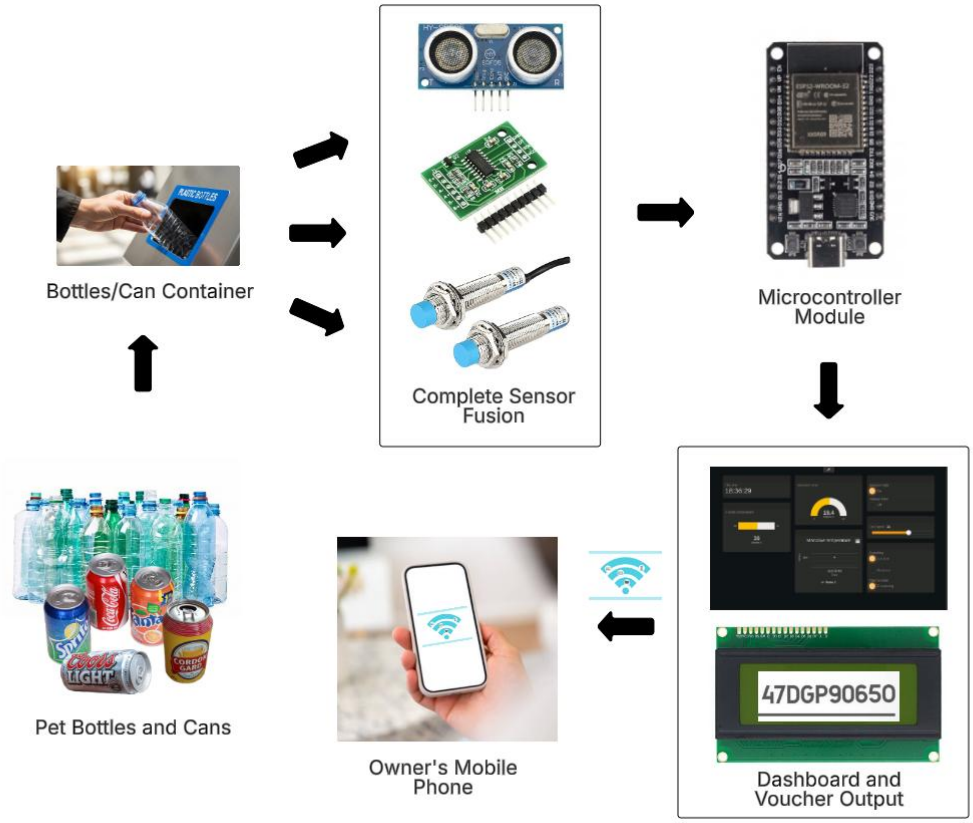

Figure 2.
Block diagram of of Eco-Connect