

## **ABSTRACT**

The increasing use of beverage packaging aligns with a society that favors an instant lifestyle, resulting in a significant amount of plastic bottle and can waste. It seems that people are generally careless about disposing of the plastic bottles and beverage cans they use. To address this issue and manage waste in an environmentally friendly way, we need a practical tool that can encourage people to dispose of their waste properly.

The Reverse Vending Machine (RVM) offers a solution to this waste problem. An RVM is a machine that can convert waste into money. Previous research on RVMs, which used light sensors, load cells, LDRs, and ultrasonic sensors and offered coin rewards, provided a basis for developing a new RVM. This new RVM can accept plastic bottles and cans and give users non-cash rewards through an easy-to-move device.

This study shifts the reward method from coins to non-cash rewards using the Gopay digital wallet platform, with assistance from RVM administrative staff. The system successfully delivered rewards within 24 hours 100% of the time. We also improved waste detection by combining load cell and proximity sensors to differentiate between plastic bottles and cans. The waste detection tests achieved 95.67% accuracy. Overall, the system had an accuracy of 90.72% from material detection to reward delivery. Additionally, the device is easy for one person to move.

**Keywords:** Waste, Plastic Bottle, Can, Reverse Vending Machine (RVM), Reward