

ABSTRACT

The problem of plastic bottle waste accumulation has become a significant environmental issue, especially in Indonesia which ranks as the second largest contributor to plastic pollution in the oceans. Traditional recycling methods dikonvers existing plastic shredding machines, such as those using barcode systems, are often too expensive or not suitable for local conditions, so a more affordable and effective solution is needed.

This study aims to design and develop an automated plastic shredding machine integrated with an Internet of Things (IoT) system without the need for barcode identification, making it more suitable and cost-effective for implementation in Indonesia. The machine is also equipped with a reward system to encourage community participation in plastic waste management.

The research process involved designing, developing, and testing a prototype of the machine. The testing included evaluation of operational time, device accessibility, bottle acceptance accuracy, and overall system performance, including realtime data display on the website interface. The results show that the machine operates within the specified time limit of under one minute and thirty seconds with an average operating time of 71.312 seconds, the machine's website is compatible with a wide range of devices, the machine has 90% accuracy in accepting valid bottles and 100% in rejecting unsuitable bottles. The website on the machine is able to display user points and tank capacity in realtime.

Keywords: plastic waste, plastic bottle, shredding machine, Internet of Things (IoT), waste management, automatic, bottle identification, machine learning