SORTIFY: SMART TRASH BIN FOR AUTOMATIC WASTE SORTING USING IOT AND AI

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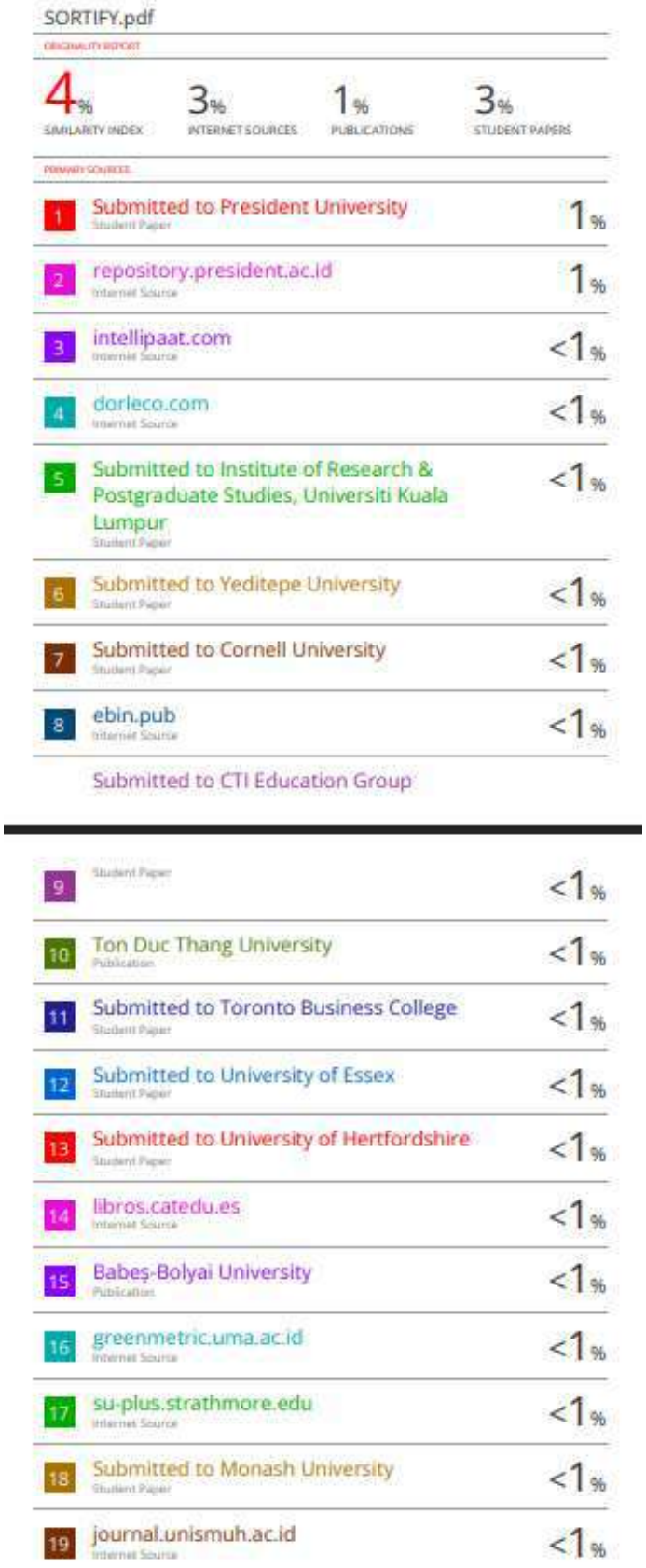

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ABSTRACT

Indonesia faces a significant waste management crisis, which is exacerbated by low public awareness and ineffective waste segregation methods at the source level. Data from the Ministry of Environment and Forestry's National Waste Management Information System (SIPSN) reveals that a large portion of potentially recyclable materials become unusable due to improper sorting practices. This results in uncontrolled accumulation of waste, blockage of drainage systems, as well as environmental pollution that poses health risks to the community. Under these conditions, it is critical for relevant agencies to implement advanced technologies and targeted interventions to increase public awareness, improve recycling rates, and manage overall environmental health.

Traditional waste management approaches that rely on manual sorting face various challenges. This method is not only time-consuming and labor-intensive, but also prone to human error and unable to handle the increasing volume of waste in densely populated areas. A new approach is needed in the form of an automated waste sorting system that can be accessed directly by the community. This kind of system can utilize artificial intelligence (AI) as automation to accurately classify waste types using visual images, as well as Internet of Things (IoT) technology.

Internet of Things (IoT) technology for real-time data monitoring. This innovation has the potential to simplify the process for the community, especially for those who lack knowledge of waste categories, while increasing awareness of the importance of keeping the environment clean.

Keywords: *Waste Management, Waste Sorting, Public Awareness, Recycling, Environmental Education, Gamification, Smart Bins, Internet of Things (IoT), Artificial Intelligence (AI), Image Recognition, Waste Classification, Automation, QR Codes, Raspberry Pi, YOLO.*

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