ABSTRACT

The problem of waste management in Indonesia is still a big challenge due to low public awareness in sorting and recycling waste. This research aims to develop and analyze a Flutter-based waste management application that integrates AI-based gamification features. This application is designed to increase community involvement in waste management by providing points-based incentives and access to information regarding correct recycling practices.

The development method used in this research is design including UI/UX design, implementation of Flutter and Firebase based systems, as well as performance and security testing. Testing was carried out through user trials, functionality tests and security tests, involving 30 different devices. Test results show that the application has a high level of user satisfaction, with an average score of 4.7 out of 5 in the aspects of ease of navigation, response speed and application stability.

However, there are several aspects that need to be improved, such as optimizing image upload speed, implementing chatbots for the live chat feature, and increasing user authentication security. With further improvements, it is hoped that this application can become an innovative solution in increasing public awareness of waste management and supporting sustainable circular economy programs.

Keywords: Waste Management, Flutter, Gamification, Firebase, Application Security.