

ABSTRACT

Environmental problems, such as obstacles in waste management, are common in large cities, including Bandung. One of the obstacles often faced is the suboptimal waste transportation route, which results in delays in waste collection, wasted fuel for waste collection vehicles, and increased workload. To address and resolve this problem, a *mobile*-based application called Bluebin has been developed that aims to optimize waste transportation routes using a genetic algorithm method. Genetic algorithms were chosen to find and find optimal solutions such as determining efficient transportation routes.

The Bluebin application was developed using the Kotlin programming language for the *front-end* and Firebase as the back-end for *real-time* data management. The system of this application has three main roles: the admin who can monitor the vehicle position from the truck driver, the TPS officer who sends reports on the condition of the waste bin, and the truck driver who receives the optimal route and transports waste from the TPS (Temporary Storage Site) to the TPA (Final Processing Site). This optimization process considers the distance from all TPS and the priority of waste transportation. The test results obtained a user satisfaction level of 84.2% (4.21) based on an evaluation questionnaire for three user roles. With the Bluebin app, it is hoped that the waste collection process will be completed more quickly and be easier to manage.

Keywords: genetic algorithm, route optimization, waste collection, mobile, Bandung City