ABSTRACT

Vertical transportation services, particularly elevators, are crucial components in the management of buildings like the TULT Building at Telkom University. 5 out of 10 elevators at this building frequently experience unequal waiting times, especially during busy periods such as class transitions and lunch breaks. This inequality can lead to discomfort and inefficiency in the use of elevator facilities. This study aims to optimize elevator scheduling in the TULT Building using a genetic algorithm to minimize elevator waiting times and improve the efficiency and convenience of the facilities.

In this study, the elevator scheduling model is optimized by considering various parameters such as the number of elevators, the number of floors, and usage patterns during peak periods. Actual data on elevator travel times and the number of floors served were collected to build a simulation model. A genetic algorithm was applied to find an optimal solution that could reduce average waiting times and distribute the load more evenly among the elevators.

This study successfully applied the genetic algorithm method to solve the problem of minimizing waiting time when using 5 lifts in the TULT Building. Simulation data showed a decrease in the average waiting time from 177 seconds with the initial scheduling to 135 seconds with the optimized scheduling. This improvement was achieved through adjustments in scheduling and a more even distribution of the elevator load, which in turn reduced user discomfort and improved the operational efficiency of the elevators.

*Keywords — **Genetic Algorithm, Elevator, Waiting Time, Floors, Scheduling***