ABSTRACT

Timetable scheduling is a complex and challenging process, especially in meeting various constraints such as hard constraints and soft constraints. The Laboratory Affairs Unit, Faculty of Industrial Engineering (FRI), Telkom University faces significant issues in scheduling practicum rooms, currently done using Microsoft Excel, resulting in inefficiency and unpredictability in room usage. To address these issues, this research developed the Simeta FRI application using the iterative incremental method. The application development was conducted with an agile approach using the iterative incremental method, allowing development to be done gradually and repeatedly, so each stage can be adapted to the users' needs.

To solve these problems, the genetic algorithm was used as a tool for automation and optimization of the scheduling practical room function. Technologies such as NodeJS, ExpressJS, and MySQL were utilized to support the application's flexibility and scalability. The research results show that the Simeta FRI application can improve efficiency and accuracy in scheduling practicum rooms, reducing the risk of congestion and uneven room usage. This application is expected to help the FRI Laboratory Affairs Unit manage practicum room schedules more efficiently and effectively and contribute significantly to software development, particularly in academic scheduling optimization.

Keywords: Genetic Algorithm, Iterative Incremental, Optimization, Room Scheduling, Timetable Scheduling.