ABSTRACT

The scheduling of practical sessions and room mapping are complex and challenging processes, particularly in meeting the various needs and constraints of the involved entities. The laboratories at the Faculty of Industrial Engineering (FRI) at Telkom University face issues in managing practical session needs that were previously handled using Microsoft Excel, leading to schedule mismatches, inefficient room usage, and human errors. To address these issues, this study developed the backend of the SIMETA FRI web-based application using the Iterative Incremental method as part of a solution for practical session room mapping. Development was carried out using an Agile approach, allowing for iterative and incremental development based on user needs. Technologies such as NodeJS, ExpressJS, and MySQL were used to support this backend, ensuring responsiveness and intuitiveness across various devices.

The management of practical session data, rooms, shifts, priority room needs, and schedules contributes to a more efficient and accurate room mapping process. The study results indicate that this system improves efficiency and accuracy in managing practical session needs and replaces the use of Microsoft Excel. Functional testing showed that all operations were successful with the correct status codes. The system was tested with 26 APIs and load testing with 10, 25, and 50 Virtual Users (VUs) showed an average success rate of 99.9%, while tests with 400 and 800 VUs showed significant performance degradation. These results indicate that the system is stable and responsive, but further improvements are needed to handle higher loads. This application is ready to be implemented at the Faculty of Industrial Engineering and is expected to optimize the management of practical session needs and room mapping.

*Keywords — **Backend, Web-Based Application, Practical Session Scheduling, Room Mapping, Iterative Incremental Method.***