

ABSTRACT

In today's digital era, the need for information technology is increasing, particularly in enhancing the efficiency of academic activities in higher education institutions. The Faculty of Industrial Engineering (FRI) at Telkom University has various laboratories that support student practicum and research activities. However, the process of borrowing laboratory rooms still faces several challenges, such as delays in key returns and difficulties in monitoring room usage in real-time. This research aims to address these issues by designing and developing a room management system based on the Internet of Things (IoT), integrated with the TTLock smart lock. The system was developed using the Waterfall method, chosen because it is suitable for projects with stable requirements and experienced development teams. The development results show that the IoT-based room management system was successfully implemented, providing easier access for users and more efficient room control and management. System testing demonstrated that all functionalities, including login, room booking, TTLock synchronization, and laboratory management, worked as expected and passed the tests. Thus, the system effectively addresses the issues of room borrowing previously encountered in FRI's laboratory module. Further development is recommended to expand the system's scope to cover all rooms within the FRI environment to maximize the benefits in room management.

Keywords: Internet of Things (IoT), room management, room borrowing, smart lock, Waterfall method