

## **Abstract**

The sports facilities is one of the college facilities so that the academic community can have physical fitness to improve their quality to be better. As an asset, sports facilities must be kept and maintained properly. However, in fact, we still make it as a conventional borrowing by borrowing in an integrated manner to the logistics. As a result, the lending process becomes longer, the absence of lending services in sports facilities, and there is a claim of borrowing, or even seizure of the use of the sports facilities. Therefore, it needs realtime lending system that can automation system. This system consists of lending registration service and web-based device that serves lending in sports facilities. The device consists of a microcontroller which connected with RFID reader as a validation tool, Wi-Fi shield for wireless communication, door solenoid to open and close the door, the LCD to display the message, buzzer to provide notification, as well as light sensors and relays to turn off the lights and turn on the lights. This system is proven to work well by utilizing MQTT protocol. The farthest distance in the microcontroller device capturing Wi-Fi signals as far as 23 meters servers with a delay of 54.55 ms, 2532.11 bps throughput and no packet loss. In addition, the overall system response from RFID scan to issue a validation is about 0.782 seconds, and can be tolerated by the user under 2 seconds.

**Keywords: RFID, microcontroller, server, validation, MQTT**