ABSTRACK

Melung Village, Baturraden District, Banyumas Regency, is a geographically upland area surrounded by many slopes and steep cliffs, as well as high soil moisture, so that these conditions become a triggering factor every year from 2015 to 2022. Melung Village always experiences landslides. Landslides are geological natural disasters caused by natural phenomena and human actions in managing land. Based on these problems, a solution is needed in the form of a landslide early detection system using the Internet of Things concept. In making this system, we utilized the ATmega328 microcontroller on Arduino R3 and the ESP32 Wi-Fi module. Parameters for measuring soil moisture rely on the FC-28 soil moisture sensor, for measuring movement in the soil using a sliding potentiometer sensor, and for detecting rainy weather using a rain sensor. Prototype analysis was carried out by testing the performance of the FC-28 soil moisture sensor, sliding potentiometer sensor, and rain sensor in the early detection of landslides compared to the comparison of each sensor. Then QoS analysis is carried out by calculating the delay that occurs in sending sensory detection value data from the system to the Antares website. The system workflow, namely the Arduino Uno microcontroller as the main controller of the FC-28 soil moisture sensor, sliding potentiometer sensor, and rain sensor, sends the detection value of each sensor to the Antares website using the ESP32 Wi-Fi Module so that soil conditions in landslide-prone areas can be monitored in real time by the user. The FC-28 soil moisture sensor has an accuracy rate of 98.39% with an average error of 1.61%, and the sliding potentiometer sensor has a sensor accuracy rate of 98.89%. The results of the delay test show an average of 155 ms with a data retrieval range of 1 to 10 meters. The results of the overall system testing are that the three sensors can be read properly, and Antares is able to display data as expected.

***Keywords**: Landslide, FC-28 Soil Moisture Sensor, Sliding Potentiometer Sensor, YL-83 Rain Sensor, Internet of Things.*