

ABSTRACT

Natural disasters are natural events that could happen at any time and cause a lot of harm to all living beings. Indonesia is one country that has a wide range of threats to the natural one earthquake.

But when an earthquake occurs during earthquakes public awareness is still lacking. Therefore, the necessary system that can provide real-time warning the public about the dangers of earthquakes. This prototype created to represents horizontal seismograph and give warnings and graphic tremor by using Wireless Sensor Network. This prototype uses MQTT and NodeMCU for data communications and uses IoT concepts for users to access anytime and anywhere.

Data communication on this prototype occurs in sensor nodes with gateways, actuators with gateways and gateways with hosting servers. MQTT transmits data to the gateway and data that has been received and then processed by the gateway. If the results obtained more than 2 Richter Scale then the gateway will send data to the actuator node to turn on the warning. In addition, data that has been processed from the gateway will be sent and stored on the hosting server through the MQTT protocol. From the results obtained from the sensors will then be matched with the standard level of earthquake strength according to United State Geological Survey, 2005 and using the British Geological Survey to determine the magnitude of the stakes on the richter scale.

MPU6050 sensor has a error rate at node A of 3.86%, node B of 1.08%, node C of 3.48% and node D of 1.48%. From the results obtained, it can be seen that the reading of the data by the MPU6050 sensor produces almost the same value as the accelerometer on the smartphone. The process of sending data from the sensor node to the hosting server obtained interarrival delay ranging from 0.2 seconds to 1.14 seconds. While the calculation result throughput value will be inversely proportional to interarrival delay.

Keywords: earthquake, wireless sensor network, Internet of Things, MQTT