

ABSTRACT

DESIGN AND CONSTRUCTION OF AN EARTHQUAKE WARNING SYSTEM USING ADXL335 ACCELEROMETER SENSOR AND SW-420 SENSOR BASED ON INTERNET OF THINGS

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Indonesia is a country prone to natural disasters, especially earthquakes and landslides. Some people have a high level of sensitivity when an earthquake occurs. However, there are some who have low sensitivity because they sometimes feel dizzy and think it's not an earthquake. The occurrence of an earthquake in Wonoharjo hamlet carries significant risks and losses due to its proximity to the southern coast, thus requiring an earthquake warning system to confirm the occurrence of an earthquake. The purpose of this research is to create a device to provide warnings if an earthquake occurs in the residential area of Wonoharjo hamlet using Arduino Uno and ESP32 as microcontrollers, along with the Accelerometer ADXL335 sensor, SW-420 sensor, and GPS NEO-6M module sensor. The prototype method was used for making the device. The results of the research show that the designed system can automatically activate sirens and lights when the vibration scale is $>3M$ and send warning notifications via Telegram, with data stored on ThingSpeak. The Accelerometer ADXL335 sensor reads the magnitude and Richter scale from the converted X, Y, Z axis outputs. The magnitude and Richter scales obtained from each test have the same difference, which is 1.91. During the testing, the SW-420 sensor showed a value of 1 when it detected vibrations. However, in the 12th test, the SW-420 sensor showed a value of 0, meaning it did not detect vibrations, even though the test provided vibrations that caused the Accelerometer ADXL335 sensor to read a scale of 3.03 SM. This happened because the SW-420 sensor experienced a delay in detecting vibrations. The GPS NEO-6M sensor detected the coordinates of vibrations when the scale was more than 3 Magnitude but failed to detect vibrations $<3 SM$, especially at long distances.

Keywords: *Natural Disasters, Internet of Things, ADXL335 Accelerometer Sensor, SW – 420 Sensor, NEO – 6M GPS Module Sensor.*