ABSTRACT

LIGHT-SCALE EARTHQUAKE DETECTION SYSTEM BASED ON IoT AND ANDROID

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This study presents the design and implementation of a light-scale earthquake detection system utilizing Internet of Things (IoT) technology integrated with an Android-based application. The system employed an SW-420 vibration sensor as the primary detection module and an MPU6050 accelerometer as a validation component to classify seismic activity into three levels: Safe, Alert, and Danger. An ESP32 microcontroller functions as the main processing unit, performing data acquisition and analysis before transmitting the processed information to the Firebase Realtime Database for real-time monitoring. A dedicated Android application was developed to display system status and provide warning notifications to users. Comprehensive testing indicated that the components were well-integrated and capable of detecting vibrations and validating seismic intensity effectively. The results demonstrated that the proposed system can detect minor seismic activity and deliver timely alerts to users, highlighting its potential as an accessible and low-cost early warning tool for small-scale disaster mitigation.

Keywords: Earthquake Detection, Android, Firebase, Internet of Things