ABSTRACT

Data center space is a vital core in the management and storage of important data for companies and organizations. Unexpected Temperature rises are often a major challenge that is difficult to address head-on. This study aims to maintain the room Temperature at a predetermined set point, prevent overheating, and damage to devices that could occur due to abnormal Temperature rise. To achieve this goal, a detailed calibration process of the Temperature monitoring device is used involving an ESP32 microcontroller and an DHT11 Temperature sensor. Using IoT technology, the device can be configured to provide automatic notifications if the Temperature approaches or crosses a set limit. This step allows users to take timely precautions to prevent overheating or costly hardware damage, while improving cost efficiency and device performance. The testing of the DHT11 sensor for monitoring temperature and humidity in a data center shows increasing accuracy at temperatures from 17°C to 23°C, with values ranging from 98.95% to 99.43%. A comparison between LCD and IoT readings reveals that LCD readings are more consistent, with an average time of 10 seconds, whereas IoT readings are more variable, with an average time of 13 seconds and a delay of 2.2 seconds. This variation is attributed to external factors such as network or signal strength. Further analysis is needed to enhance the reliability and responsiveness of the IoT system.

Keywords: Data center, IoT, Calibration, Temperature, Microcontroller