ABSTRACT

Strawberry production in Indonesia increased by 68% from 2010 to 2019, reaching 41,035 tons. However, a 24.7% increase in imports in 2019 indicates that market demand has not been fully met. This is due to insufficient knowledge and interest in strawberry cultivation. Strawberries grow in highlands with temperatures of 17-20°C and humidity of 80-90%. Therefore, cultivation in lowlands is difficult. The importance of monitoring temperature and humidity in greenhouses has driven innovation in monitoring systems using the NRF24L01 module. This study designed an architecture for monitoring temperature and humidity using the NRF24L01 module through six stages: problem identification, literature review, hardware and software design, system testing, data collection, and results analysis. Measurement results showed temperatures in the greenhouse ranging from 24-26°C and humidity from 80.3-85%. With a transmitter system consisting of Arduino Uno R3, DHT11 sensor, and NRF24L01 module, and a receiver system using ESP32 and NRF24L01 module, data transmission operated effectively with high information accuracy. The temperature difference was only 2,35 °C higher and humidity 4,8 % greater compared to room thermometers. Data transmission between transmitter and receiver was effective within a range of 0-500 cm. This research concludes that the monitoring system is reliable for managing strawberries in greenhouses.

Keywords: Arduino Uno R3, DHT11 Sensor, ESP32, Greenhouse, NRF24L01 Module.