IMPLEMENTATION OF IOT-BASED OYSTER MUSHROOM CULTIVATION MONITORING SYSTEM WITH FIREBASE AND MIT APP INVENTOR INTEGRATION

Luthfi Akmalur Rizal
Computer Engineering Study Program, Faculty of Science & Technology
University of Technology Yogyakarta
Jl. Ringroad Utara Jombor Sleman Yogyakarta
E-mail : lutfirizal747@gmail.com

ABSTRACT

Oyster mushroom cultivation currently relies on manual monitoring of temperature and humidity, which is inefficient and prone to errors. This research aims to design an automated monitoring system based on the Internet of Things (IoT) that can improve the efficiency and quality of oyster mushroom harvests through real-time monitoring. The system uses an ESP32 as the main microcontroller, a DHT11 sensor to measure air temperature and humidity, and a soil moisture sensor to measure the moisture content of the growing medium. Data is sent via a WiFi connection to Firebase and displayed in a dashboard via Node-RED. An MIT App Inventor-based application serves as the user interface, enabling monitoring and control of devices such as pumps and fans in both automatic and manual modes. Testing demonstrated a 100% success rate for automatic control and a 2.88% accuracy rate for the DHT11 sensor, with an average error of 2.88%. This system has been proven to support more efficient and modern oyster mushroom cultivation management.

Keywords*: IoT, ESP32, DHT11, soil moisture, Firebase, Node-RED, MIT App Inventor*