ABSTRACT

Maggots derived from the Black Soldier Fly (BSF) are widely studied for their characteristics and high nutritional content. Maggot can be utilized as an alternative feed for livestock as a source of protein. However, controlling maggot temperature and humidity greatly affects the success of maggot cultivation, both in terms of development and survival. These challenges make farmers less interested in cultivating BSF maggots.

This research aims to produce an Internet of Things (IoT)-based device capable of monitoring and controlling the temperature and humidity of maggot living environment soil in real-time and integrated with mobile applications. Based on the results of the proposed solution, the monitoring and controlling device uses solution A and the microcontroller uses solution K. The data obtained from the sensor will be processed to control the actuator and will be connected to Firebase to be displayed on the mobile application. This allows users to perform real-time remote monitoring and controlling through a mobile application.

Testing the entire system shows that maggot cultivation equipped with the IoT system has a length of 2 cm with a weight of 122 grams for every 100 maggots. Meanwhile, conventional maggot cultivation has a length of 1,45 cm with a weight of 94 grams for every 100 maggots. This shows that the system can increase the productivity of maggot development due to the control of maggot environmental parameters. In addition, the system also tested the DHT22 sensor which has an accuracy of 97,64% and the Soil Moisture sensor which has an accuracy of 96,9772%. Mobile application testing involves usability aspects using the System Usability Scale (SUS) testing method, resulting in an average value of 74,25. The system also shows the Quality of Service value when sending and receiving data between the application and database with a throughput of 72317,46 bps, packet loss of 5,6 %, delay of 101,85 ms and jitter of 0,156365 ms.

Keywords: Black Soldier Fly, Internet of Things, mobile application

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