ABSTRACT

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Study Program	: Informatics Engineering
Title	: Design and Development of Monitoring Temperature, Humidity, and Light Based on The Internet of Things for BSF Insectarium
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This thesis explores the transformative potential of precision agriculture through the implementation of an integrated Internet of Things (IoT) monitoring system for Black Soldier Fly (BSF) farming. The study involves careful observation, interviews with BSF cultivation experts, and an in-depth literature review to provide comprehensive insights into the challenges and opportunities in the field of BSF farming. The research progresses through several stages, starting with direct observation of BSF behavior and environmental conditions in the insectarium. Subsequent interviews with BSF cultivation experts and an in-depth literature review on IoT applications in agriculture, with a specific focus on BSF, contribute to building the theoretical foundation. The study involves sensor data collection, using DS18B20, DHT22, and LDR sensors to measure temperature, humidity, and light intensity in the BSF insectarium.Research stages include tool needs identification, design, production, and installation, culminating in the creation of a real-time monitoring website displaying environmental conditions. The monitoring tools are rigorously tested to evaluate reliability and accuracy in measuring critical parameters for BSF cultivation. The implementation of this research takes place in the insectarium of PT. Greenpprosa, providing a practical dimension to the study. The IoT-based monitoring system integrates multiple sensors and microcontrollers, including NodeMCU ESP 8266 and Arduino Mega 2560, to measure and transmit data. This system includes monitoring temperature, humidity, and light, enhancing precision in BSF farming practices. The thesis concludes with results showing successful tool development, addressing challenges and potential in BSF farming. The developed tools and the real-time tracking website not only contribute to existing knowledge but also pave the way for further research and innovation in insect farming. Future directions propose exploring more advanced IoT applications, optimizing monitoring systems, expanding the range of environmental parameters, and integrating machine learning for predictive analysis. Collaborative efforts between researchers, industry experts, and policymakers are crucial to addressing emerging challenges and promoting sustainable insect farming practices, with the potential to revolutionize waste management, alternative protein production, and green bioenergy generation globally.

Keywords: Temperature, Humidity, Light, IoT, BSF