IOT-BASED SMART FARMING IMPLEMENTATION USING THE MQTT PROTOCOL

Abstract

This research aims to implement smart farming solutions utilizing the MQTT protocol within the framework of the Internet of Things (IoT). The use of IoT technology is expected to increase agricultural productivity and efficiency through better monitoring and control of crop conditions. Analysis, system design, tool development, and functionality testing are the methods used in this research. The results show that the developed system is capable of real-time monitoring of environmental parameters such as soil moisture, temperature, and lighting. This system can provide notifications to users through the red node dashboard regarding plant conditions and maintenance needs such as watering using integrated sensors and MQTT-based communication. This system can also use soil moisture sensor data as an indicator to manually control the water pump actuator at the water source by the user according to the soil moisture status. This research concludes that the implementation of IoT-based smart farming with MQTT protocol can improve efficiency in agricultural management, provide accurate and real-time information for better decision-making, and support the sustainability of agricultural production in the digital era.