ABSTRACT

DEVELOPMENT OF THE JEMBATANI SMART FARMING

APPLICATION MODEL BASED ON THE INTERNET OF THINGS (IoT)

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This study aims to enhance the agricultural sector's contribution to Indonesia's Gross Domestic Product (GDP), which has shown a positive trend despite the adverse effects of the COVID-19 pandemic. In 2019, the sector contributed IDR 2,012.7 trillion, which increased to IDR 2,428.9 trillion in 2020. This indicates that agriculture remains a crucial pillar of the Indonesian economy, particularly during the pandemic. One key factor supporting the sustainability and improvement of this sector is the adoption of digital technology, notably the Internet of Things (IoT), often referred to as smart farming. The goal of implementing smart farming is to enhance agricultural efficiency and productivity by using sensors and microcontrollers to monitor and optimize the variables that influence plant growth. The purpose of this study was to develop the Jembatani application, which employs IoT-based smart farming techniques to monitor and irrigate agricultural land in real-time. This technology utilized various sensor and microcontroller components, including the NodeMCU ESP-32, DHT-11 sensor, soil moisture sensor, and a Firebase-based cloud computing system, to oversee and manage factors affecting plant growth. The prototype method was adopted in this study to develop the Jembatani application system. As a result, this research produced a mobile application that facilitates the monitoring and irrigation of plants. Compared to conventional agriculture, this system offers flexible advantages, allowing for real-time monitoring and watering.

Keywords: Jembatani Mobile Application, Internet of Things, NodeMCU ESP-32, Real time Monitoring and Watering