

DESAIN PACKAGING WATERPROOF PADA SMART HYDROPONIC SYSTEM BERBASIS IOT

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ABSTRACT

Smart Hydroponics System based on the Internet of Things (IoT) is a modern solution for plant cultivation, particularly in urban environments. However, the electronic components used in this system are prone to damage caused by moisture and water exposure. This study aims to design and test waterproof packaging to protect the control and monitoring components of the Smart Hydroponic System based on IoT. The design was developed using SketchUp software, with considerations for ergonomics, ease of installation, and maintenance. The research employed a Research and Development (R&D) approach, which included identifying system requirements, creating a 3D design, evaluating feasibility through expert questionnaires, and conducting functional testing for water resistance. The evaluation results showed that the design achieved a feasibility score of 83% based on expert assessments, indicating that the packaging is considered very good and feasible for use. Functional testing demonstrated that the packaging effectively protected electronic components from moisture and water exposure without disrupting the system's operation. Therefore, this waterproof packaging design offers a reliable, and applicable protection solution for IoT-based hydroponic systems in modern agricultural environments that are humid and prone to water exposure.

Keywords: *IoT, hydroponics, packaging, waterproof, product design, ESP32*