

# ***IoT-Based Control System for Shrimp Pond Water Monitoring Equipment***

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## **ABSTRACT**

*Vannamei shrimp cultivation is highly dependent on water quality, therefore monitoring parameters such as acidity level (pH), temperature, and Total Dissolved Solids (TDS) must be done regularly. Manual monitoring is considered inefficient because it is time-consuming and labor-intensive, and cannot provide direct and real-time information. This research aims to create and implement a pond water monitoring control system that uses Internet of Things (IoT) technology with an ESP32 microcontroller. This system uses a pH sensor, TDS sensor, DS18B20 temperature sensor, and water level sensor to obtain data on water quality. The measurement results are then displayed directly on a 16x2 LCD screen and the Blynk application. In addition to monitoring, the system can also operate the drain pump and the filling pump automatically using a relay module when the water quality does not meet the set limits. The research method used is R&D, which consists of several stages such as designing, installing, programming, resetting, testing, and evaluating the system. Test results showed that the pH, TDS, and temperature sensors performed well after being calibrated using the linear regression method, with a small average error, resulting in data nearly identical to that of standard measuring instruments. The system is also capable of sending data directly to the Blynk application and automatically controlling the water filling and draining process. Thus, the system can make pond water quality monitoring more efficient and assist farmers in maintaining the pond environment in good condition for the growth of whiteleg shrimp.*

***Keywords:*** *Internet of Things, ESP32, Water Quality Monitoring, Shrimp Pond, pH Sensor, TDS Sensor, DS18B20.*