

ABSTRACT

Tilapia farming often faces challenges in maintaining water quality and ensuring accurate feeding. This study developed an IoT-based automatic monitoring system to monitor critical parameters such as water pH and temperature in real time while regulating feeding schedules. The system uses a Wemos D1 R1 ESP8266 microcontroller as the control center, equipped with a pH-4502C sensor to measure water acidity and a DS18B20 sensor to monitor temperature. The DS3231 RTC module functions as an automatic feeding scheduler. Test results demonstrate the system's highly accurate performance. The pH sensor achieved 98.3% accuracy for acidic conditions (pH 5-6.2), 97.94% for neutral conditions (pH 6.8-7.5), and 98.84% for alkaline conditions (pH 9-10.5). Meanwhile, the temperature sensor recorded an accuracy of up to 98.92%. The system successfully performed automatic feeding five times a day on time and was able to send real-time notifications when water parameters deviated from normal limits, namely pH 6-8 and temperature 24-28°C. Through the web-based interface on the Blynk platform, farmers can monitor pond conditions anytime and from anywhere. This system has proven effective in enhancing the efficiency of koi carp farming by maintaining optimal water quality and ensuring regular feeding. This study demonstrates that the application of IoT technology can serve as a practical solution for small-scale and medium-scale fish farming challenges.

Keywords: *Internet of Things, water quality monitoring, water pH, water temperature, automatic feeding, koi fish farming*